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MARKET FORECAST

U.S. Systems Integration/ Professional Services Market

1994-1999

U.S. Business Integration Program

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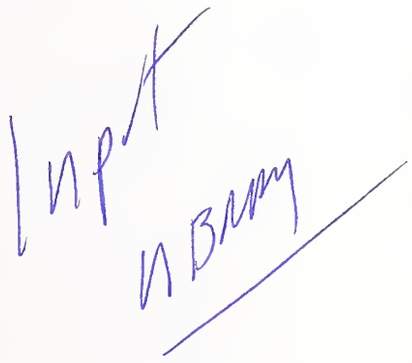
U.S. Systems Integration and Professional Services Markets, 1994-1999



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M&S 459/01 2/95

Abstract

This report analyzes the systems integration and professional services markets in the U.S. for 1994-1999, updating the 1993-1998 forecast. Included in the analysis is a forecast of the size, growth and driving/inhibiting factors for each industry segment. The report identifies and analyzes trends in projects and business issues that impact these markets.

U.S. Systems Integration and Professional Services Markets, 1994-1999 will assist vendors who are in, or about to enter, these markets by aiding their understanding of the types of services used today and in the future, providing information on criteria used to select vendors, and on the business and technical issues driving the use of services.

The report contains 82 pages and 52 exhibits.

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Published by
INPUT
1881 Landings Drive
Mountain View, CA 94043-0848
United States of America

U.S. Business Integration Program

U.S. Systems Integration and Professional Services Markets, 1994-1999

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BIMR • 683 • 1994

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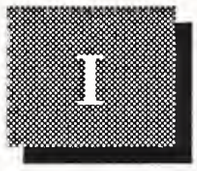

Introduction

This report, *U.S. Systems Integration and Professional Services Markets, 1994-1999* is part of a series of annual market analysis reports issued by INPUT, which identify the key trends and directions of the information services market and forecast the size of the market over the next five years. This report is produced as part of the INPUT's US Business Integration Program.

A
Scope and Purpose

This report provides an analysis of the systems integration (SI) and professional services (PS) markets in the United States for the period 1994 to 1999. It also summarizes the trends and market factors that influence the size and composition of both the commercial and public sector segments of the US information services market.

It provides forecasts of expenditure and growth rates for systems integration and professional services.

The report identifies vendor and buyer issues and discusses trends that affect vendors in, or about to enter, these markets. INPUT also makes strategic recommendations for vendors. The analysis considers the size, growth and factors influencing 15 vertical industry markets.

The objective of the report is to assist vendors by:

- Providing information on the types of services used today and in the future
- Identifying criteria used to select vendors
- Identifying the technical issues driving the use of services
- Highlighting the business issues driving the use of services
- Identifying users concerns when using outside vendors

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B
Methodology

This report combines the analysis of the systems integration and professional services markets in one report. This is a change from the approach taken in previous years where the professional services forecast and analysis was produced as a part of the Market Analysis Program. The reason for the change is that INPUT has found that users and vendors often use the terms "Systems Integration" and "Professional Services" interchangeably regardless of the service content. However, INPUT continues to forecast these markets separately, in line with the definition of these services (or delivery modes).

The data presented in this report has been compiled from a variety of sources. Primary research was conducted with both vendors and clients in the systems integration and professional services markets. Data was gathered from vendors concerning their revenue and market activity as well as their opinion and strategies. Over 2000 users were polled as to their spending intentions and their future requirements. In addition, users were interviewed regarding their views on working with SI and PS vendors.

Structured questionnaires were used to collect this data and opinions on a variety of topics concerning these markets throughout the year. Additional information was collected during frequent discussions between INPUT and the vendors. Secondary research sources, such as industry journals, periodicals and other INPUT reports were also studied in the preparation of the report.

The figures in the charts and tables of market and forecast expenditures shown in body of this report are rounded as follows:

- Markets of $1 billion or greater are rounded to the nearest $50 million
- Markets of $100-999 million are rounded to the nearest $10
- Markets less than $100 million are rounded to the nearest $5 million
- The forecast tables in Appendix B are shown to the nearest $1 million

C
Report Organization

The report consists of four additional chapters plus two appendixes:

- Chapter II is an Executive Overview describing the key conclusions and vendor recommendations found in the report.

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- Chapter III analyzes factors driving the use of SI and PS, user buying patterns and vendor competition
- Chapter IV provides an explanation of the definition of SI and PS plus the forecast for these markets as well as a discussion on pricing trends in the market.
- Chapter V considers the size and growth of SI and PS in each of the 15 vertical industry markets.
- Appendix A provides a definition of terms used in this report
- Appendix B shows the detailed forecast for 1994-1999 and supplies a reconciliation with the forecast produced in the corresponding reports for 1993-1998.

D
Related Reports

For additional insight into the SI and PS markets over the next 5 years readers are encouraged to consult other INPUT reports such as the following:

U.S. Professional Services Market, 1993-1998, November 1993

U.S. Systems Integration Market 1993-1998, March 1994

Desktop Systems Integration Market, April 1994

Contractual Approaches to Project Risk Reduction, May 1994

The Relationship Between BPR and Systems Integration, September 1994

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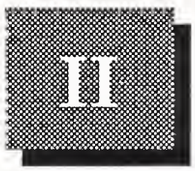

Executive Overview

This chapter highlights some of the key conclusions and vendor recommendations made in this report. The discussions and analyses of the systems integration (SI) and professional services (PS) markets are combined in this report because of their overlapping service content and the fact that they are beginning to lose their historic distinction in the eyes of the customer community.

There are two key distinctions between contracts for SI and contracts for PS:

1. A professional services contract does not include any hardware

2. Systems integration contracts always involves the vendor taking prime responsibility for the successful completion of the contract on time and within budget

A detailed discussion of the differences between these type of services is included in Chapter IV.

Based on these differences between the types of expenditure the SI market is a separate market from the PS market and therefore INPUT will continue to analyze and forecast them separately.

Professional services is the larger U.S. market with $23.0 billion in 1994 expenditures as opposed to $11.2 billion for SI. The latter, however, is forecasted to grow at a faster rate, 15% versus 11% annually through 1999.

Both of these service modes are critically positioned in the planning and implementation stage of major projects. These projects are responses to profound shifts taking place in the business environment as organizations react to (or attempt to cause) changes in competition, technology, customer demand, financial pressures, and workforce makeup.

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A
Driving Forces

The major forces fueling SI and PS markets are shown in Exhibit II-1. The recent ***upturn in the U.S. economy*** and corporate profits has created a more positive attitude about IS investments as well as providing increased funding for them.

Exhibit II-1

Driving Forces

- U.S. economic upturn
- Business process reengineering
- Technology and related IT architecture issues
- Limited in-house expertise
- Functional users are becoming buyers of services

Source: INPUT

Business process reengineering (BPR) is a corporate response to many factors, including the increasing complexity of business relationships (e.g., partnering with suppliers, competitors, customers, and other third-parties). New ways of doing business demand information systems to support unique ways of communicating and providing service. Often these take on industry or application specific form, or they are driven by new technology (e.g., client/server, imaging). BPR is a form of professional services, as is any IT-related consulting, and as such may included in an SI or PS contract.

BPR has quickly become a major focus of attention for management consulting and SI vendors because of its early stage influence in large scale project decisions. Exhibit II-2 shows the range of services involved in business process reengineering. The chronological flow from left to right suggests strong account control benefits accrue to SI and PS vendors who can add management consulting to their service portfolio.

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This can be achieved by:

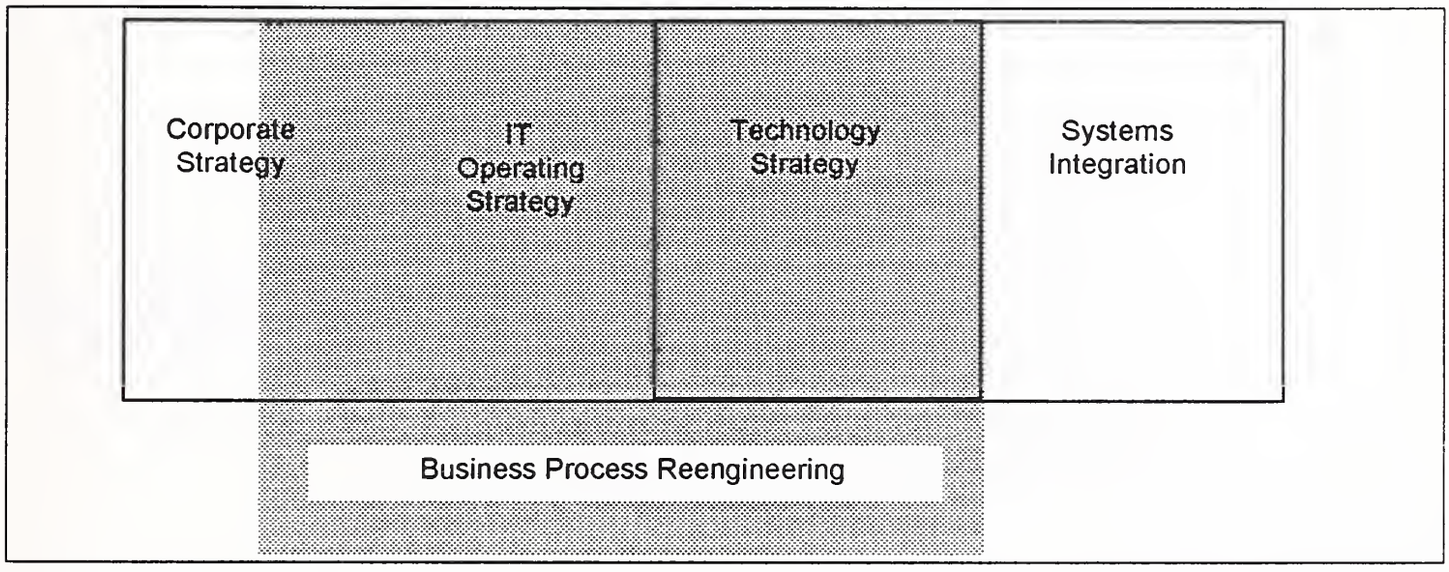
Expanding the range of internal expertise

Partnering with firms who traditionally operate in this area (e.g., McKinsey, Bain & Co.)

Acquiring smaller specialists with niche market expertise

Exhibit II-2

Span of BPR Services



Source: INPUT

The importance of BPR to the SI and PS vendor's strategy is confirmed by Exhibit II-3 which shows what is on the mental agenda of users' top managers.

Exhibit II-3

Top Management Concerns

- Reengineering of business processes
- Aligning IS and corporate goals
- Organizing and utilizing data
- Instituting cross-functional information systems
- Creating an information architecture

Source: Computer Sciences Corporation

Note that Exhibit II-3 also highlights ***technology/ architecture*** as a top management concern. This is another major driver in SI and PS markets

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which have been historically paced by application skill requirements. So much new platform/architecture-related technology has emerged that vendors must possess competency across an overwhelming range of technology and application areas to be responsive to market needs. This places emphasis on vendor's internal training programs, partnering and acquisition strategies.

Limited in-house expertise continues as a traditional demand generator for going outside for SI and PS services. Constrained internal IS budgets, especially for headcount, force the need to go outside for project accomplishment. In addition, there is an expectation for a more rapid solution accomplishment from external vendors.

There are ***more buyers of SI and PS services*** due to shifts in the internal buying process. BPR issues demand the participation of departmental/functional users plus senior executives in the purchasing decision. These non-IS buyers are also playing a much bigger role in the implementation phase. Vendors must now deal with a more complex situation, developing relationships with, and selling to, both users and corporate IS departments. In many cases, vendors, with a historic focus on targeting the IS function, have missed the booming user departmental client/server market. This omission will have an even more profound impact in the future as BPR gathers momentum

B
Inhibiting Factors

Factors inhibiting the growth of SI and PS markets are shown in Exhibit II-4. In spite of an improving economy, and increased budgets, there are simply more SI and PS projects than funding to support them. ***Budget limitations and competing needs*** are more severe in certain vertical markets and geographic areas, whose recovery hasn't matched the rest of the country. Vendors need to carefully select market and client targets which shown the promise of strong funding ability.

Exhibit II-4

Inhibiting Factors

- Budget limitations/competing needs
- Skills shortage
- Low user risk tolerance in certain vertical markets

Source: INPUT

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Skill shortages, within the vendors, may become the most serious factor limiting SI and PS growth. Skills always lag behind the introduction of new technology. SI and PS firms face an explosion of new technology from areas such as client/server, networking, open systems, imaging, object-oriented programming, multi-media, and wireless communication options. Sometimes, neither internal training nor the external labor market may be able to supply needed resources. Wiser users demand "proof" of skills and project staffing expertise. Vendors with more robust internal training will have an advantage. Those without large internal training programs must resort to partnering or acquisition.

Low user risk tolerance limits SI and PS market size and growth in vertical markets such as health care, insurance and education. These verticals are characterized by combinations of old legacy mainframe and/or turnkey systems, reluctance to disrupt old operating processes with new systems, and a general aversion to change.

C
Recommendations for Vendors

Discussion surrounding the various recommendations for SI and PS vendors is spread throughout this report. However, the main recommendations may be summarized as:

- Promote an image of value
- Expand the range of available services
- Develop a wider range of relationships within user organizations
- Recognize the different requirements of functional users compared to internal IS departments
- Enhance pricing options with innovative combinations of fixed price with phase or range based pricing

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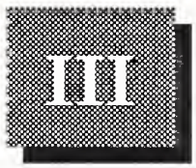

Systems Integration and Professional Services Environment

A
Factors Driving Use of Systems Integration and Professional Services

1. User Needs/Issues

Underneath the traditional broad purchasing motivations, like increased revenue, productivity, and service, lie the more tangible SI and PS buying reasons reported by users, the importance of each of which is graphically noted in Exhibit III-1. These eleven driving factors represent a powerful, prioritized list of criteria for the development of vendor marketing programs and materials.

- The primary reason that encourages use of an SI vendor is the need to solve problems associated with complex and/or large-scale business processes.

- There are certain processes in each industry or vertical market that become prime targets for SI solutions. The major SI vendors are continually analyzing other processes in order to identify the potential for new solutions with the promise of these becoming industry standards (and the vendors becoming known as specialists in these areas).

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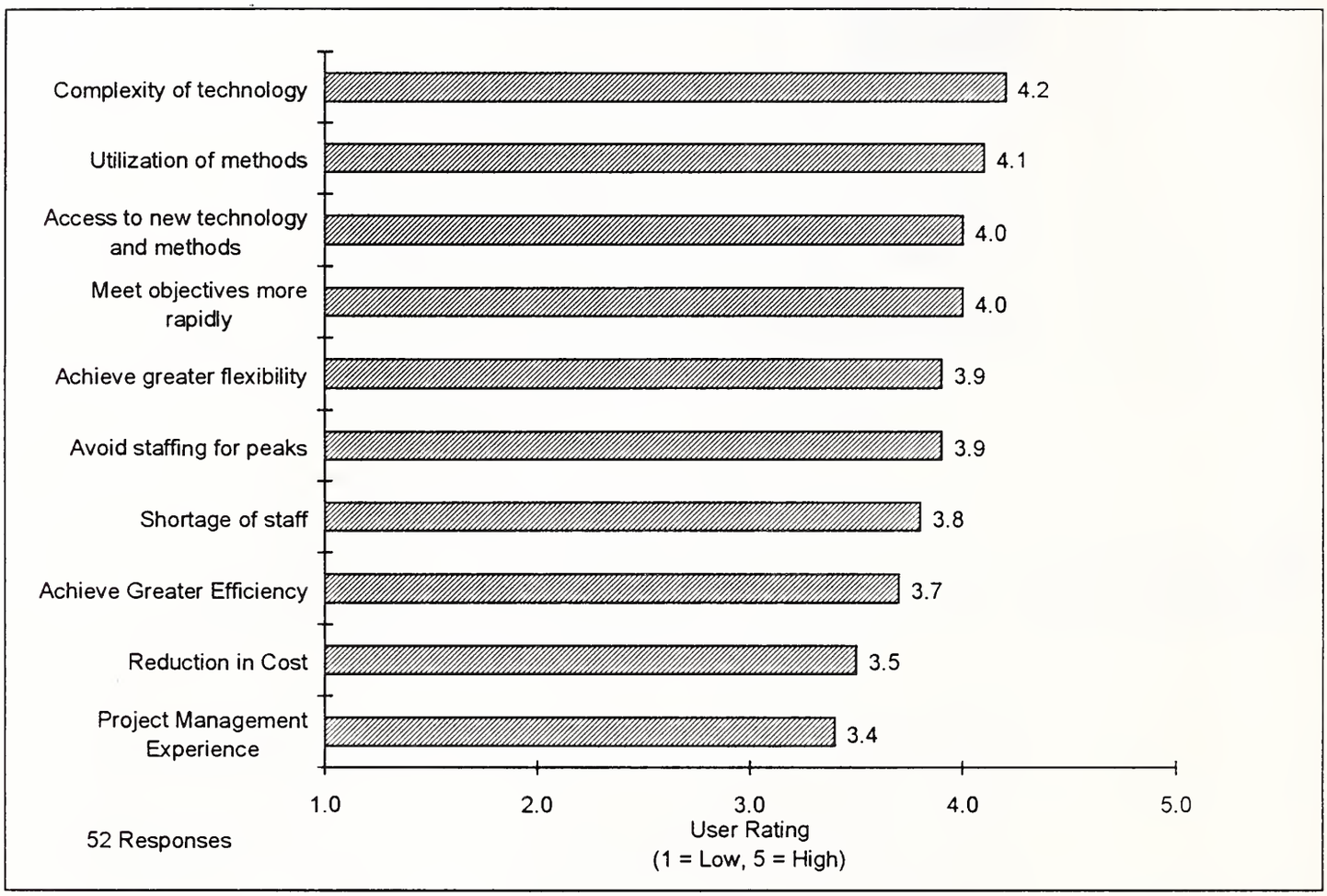
Exhibit III-1

Factors Driving SI and PS Usage



Source: INPUT

- In addition to complexity and specialization needs, users are also driven outside to gain access to new technology and meet internal objectives more rapidly than an in-house approach would permit. Client/Server and networking requirements (geographically and between applications and business processes) are the primary technical drivers.

- Often users go outside to SI and PS vendors to augment internal expertise and staffing. This provides more technical flexibility in meeting goals and sometimes is the only way a project can be accomplished. Often the reengineering of a business process signals the need for outside PS services in the form of management consulting assistance.

Exhibit III-2 shows another view of user needs as reflected in their SI and PS vendor selection criteria for client/server projects. The dominant theme is users' desire for a vendor to support project success across a wide spectrum of activities, such as technical skills, marketing to users, and training.

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These factors also are a testimony to the increased importance of users and the fact that they are learning to work separately from, as well as in conjunction with, IS departments on projects.

Another factor that influences selection is the ability of vendors to promote an image of value. Users are interested in the question of value (applications that have fewer problems, are easy to use and can be upgraded), but some of them state that the values a vendor offers have to be pointed out and emphasized. Unless an image of value is established, selection may be made only on price and past accomplishments.

Exhibit III-2

Selection Criteria for Client/Server Project Vendors

Factor
• Availability of client/server skills
• Ability to market to users
• Availability of client/server high/level training
• Projecting an image of value
• Ability to work with IS staff and users

Source: INPUT

At the highest user organization level, the market drivers shift to those shown in Exhibit III-3. It becomes critical for vendors to have people with strong executive-level communication skills to address these broad, often conceptual, issues. Business process re-engineering is a key factor driving SI and PS decisions. Vendors need to develop these skills or seek a partner that has them.

Exhibit III-3

SI and PS Market Drivers

- Reengineering of business processes
- Aligning IS and corporate goals
- Organizing and utilizing data
- Instituting cross-functional information systems
- Creating an information architecture

Source: Computer Sciences Corporation

2. Technological Factors

Technical issues important to users are shown in Exhibit III-4. There is a clear emphasis on practical, observable system performance factors rather

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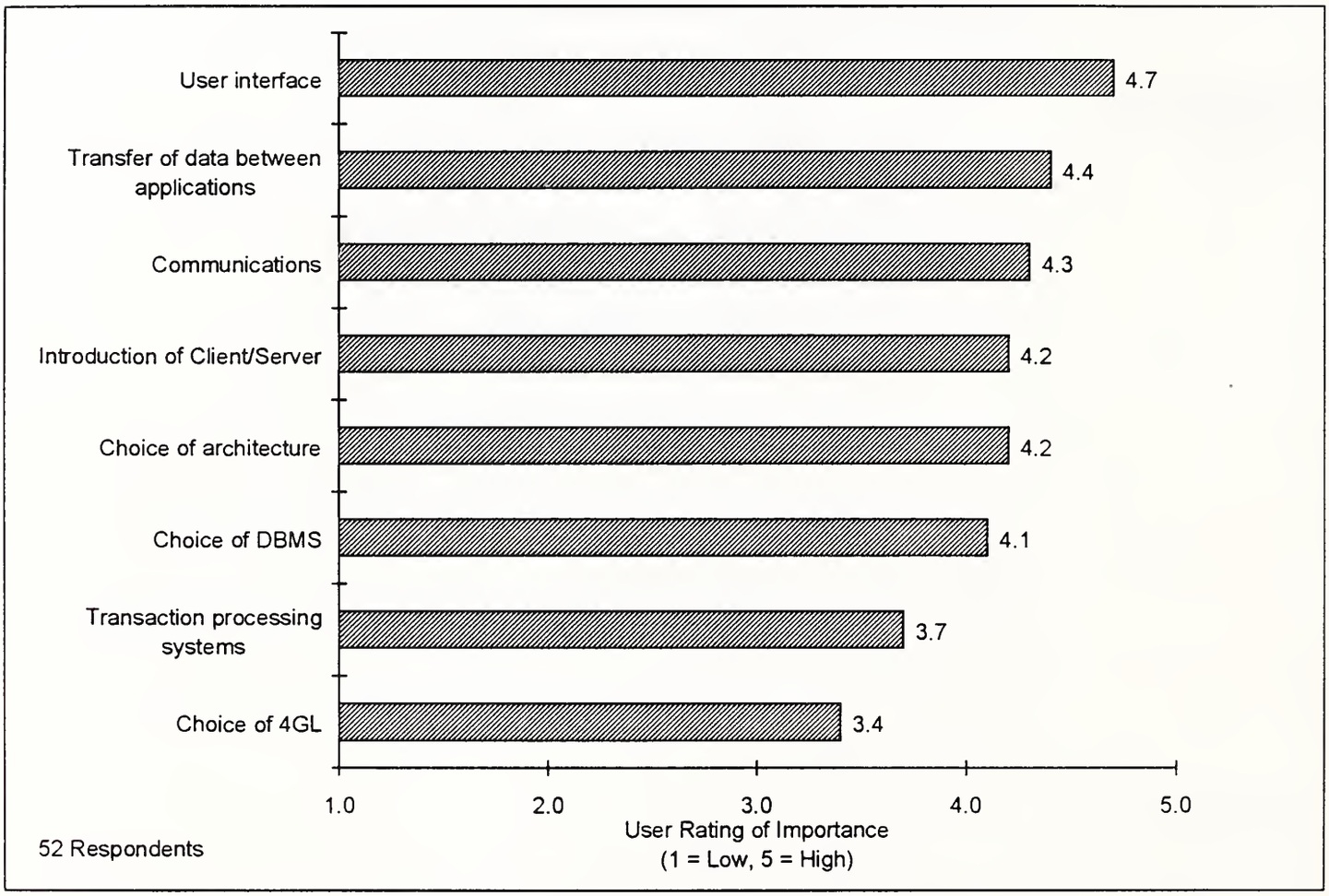
than the hidden underlying technology. Users are, and will continue to be, more interested in "How will it look? How will it perform?" than in which database technology or 4GL will be used to deliver that performance. In other words, users are not concerning themselves with the mechanics of the application, but with its usability.

Exhibit III-4

User's Important Technological Issues for the Future



Source: INPUT

B
User Buying Patterns

1. Systems Integration and Professional Services Procurement Trends

The majority of projects are still in-house, and yet this percentage may decrease as the economy picks up if IS department hiring does not accelerate at a fast enough rate.

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There is a shift, from the implementation of huge infrastructure projects, to the implementation of multiple, smaller departmental client/server projects at the user level. These are often separately contracted phases of a larger project. This portion of the market will see more significant growth (20% CAGR) over the next several years than the large infrastructure projects (10% CAGR).

Users are making more of their own decisions and, increasingly, using their IS function as a procurement channel.

As SI and PS procurement decision making becomes more decentralized, IS functions will become involved in fewer, but larger, procurement decisions and require less staff to interface and support users on the smaller projects.

The "buyer" of SI and PS services for large projects will typically be more than one person or organization. The buying process involves an often challenging coordination of multiple players and organizations, each with their own needs and priorities. In the future, the management of relationships with this expanding group will be a challenge for the vendor sales force.

The buying process involves more than competitive product comparisons. Vendors must become more proficient at demonstrating technical capabilities to prospective clients but must combine this with a successful track record of on-time delivery.

2. Inhibiting Factors

As Exhibit III-5 shows, there are definite factors that have inhibited the use of SI and PS vendors according to respondents.

Uncertainty in business planning is a key inhibitor, having more of an impact than budget limitations. This exhibit is designed to provide some examples of inhibiting factors rather than being a prioritized list in descending order of importance. The uncertainty may be related to the discontinuation or sale of product lines or other major business changes. Corporate acquisitions and mergers may also be reasons to suspend consideration of SI and PS projects.

Considering outsourcing affects the use of SI and PS vendors because it may result in the planning, development and maintenance of future systems being passed to an external provider. This limits the potential for SI and PS vendors who cannot or do not offer outsourcing services to gain maximum share of the market. INPUT views this as one of the forces driving SI and PS vendors to offer outsourcing services.

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Exhibit III-5

Key Factors Inhibiting Use of SI and PS Vendors

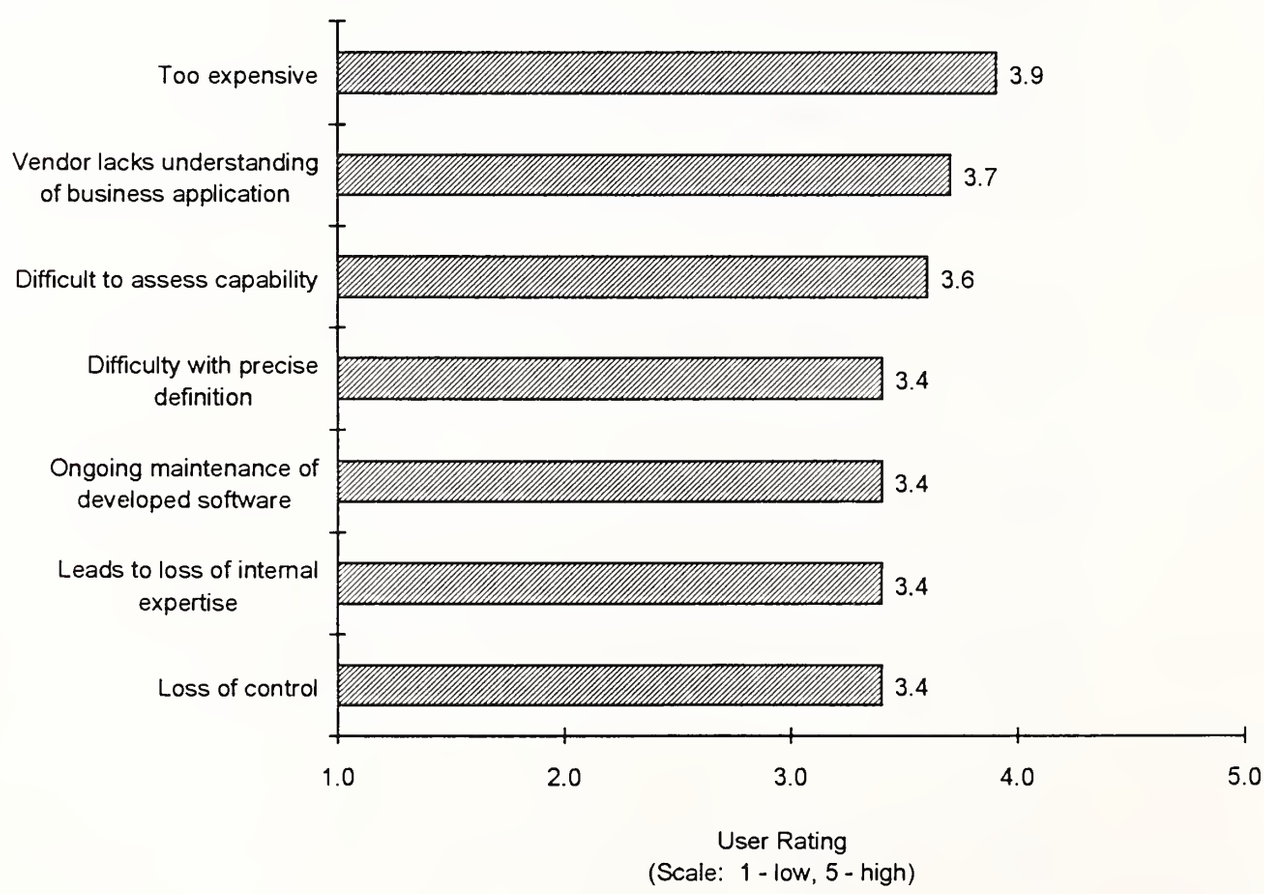
Factor
• Uncertainty in corporate planning
• Budget limitations
• Short term pressures on IS departments
• Merger, acquisitions being planned
• Outsourcing being considered

Source: INPUT

Exhibit III-6 describes a set of user concerns at a more tactical level. No single concern dominates, and any one, by itself, can be enough to stalemate the procurement process.

Exhibit III-6

User Concerns About Using External SI and PS Vendors



Source: INPUT

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Issues under an SI and PS vendor's control are:

- Total purchase price of the implemented solution including associated services. This emphasizes the need for identification of the value of the solution when measured in terms of benefits to the business instead of low cost.
- Understanding the client's business. This illustrates the necessity for vendors to demonstrate their industry and application expertise early in the sales cycle.
- User assessment of the vendor's capabilities. In addition to industry expertise, vendors should provide examples of the technical abilities of the staff that may be involved in the project.
- Ongoing maintenance of newly developed software. This provides an opportunity for vendors to offer application management services and is becoming increasingly popular as applications become more complex and the maintenance more difficult.

C
Vendor Competition

1. Analysis of Competition

Competition has been rapidly increasing for SI work. One Fortune 100 company reported that presentations on the use of SI had been recently offered not only by its IT hardware vendors, but also by several large professional services firms, its two auditing firms, strategic consultants and three major SI vendors.

One reason for this increase in competition is the difference in rates between SI and some professional services business, as shown in Exhibit III-7.

SI and PS project-based contracts involve committing to achievement of a complete solution and acceptance of the associated risks. This is priced and paid for at a higher rate than supplying additional staff to work on a time- or task-based assignment, as offered by many professional services firms.

Professional services vendors also compete against numerous temporary services firms, and one person, or small vendors, offering professional services capabilities at very low prices. These smaller vendors have increased greatly in number due to corporate personnel reductions, the growth of independent consulting and increased use of off-shore development staff.

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Specialist services, for example, BPR consulting, some application areas (such as SAP), and client/server technical expertise, command premium prices.

Exhibit III-7

Reasons for Increasing SI and PS Competition

- Project-based services have a higher margin than staff augmentation services and are growing at a higher rate
- Continuing pressures on professional services billing rates from temporary services vendors and small PS vendors
- SI projects are more likely to lead to add-on work
- SI can lead to outsourcing
- Outsourcing is being considered more often by users

Source: INPUT

There is more guarantee of obtaining a substantial amount of continuing work — as well as higher pricing — with SI contracts than with staff augmentation services work. Some professional services contracts are also more likely to shrink or be subject to reconsideration if business changes or new IT technology is considered.

Both SI and PS can also provide the opportunity to preclude competition in some situations. If the vendor becomes involved in consulting work that requires reengineering or other strategic level consulting, there is a good possibility the resulting projects will utilize the SI vendor.

In the past, a corporation would often use one vendor as a consultant and select another vendor to implement the systems recommended. In a reengineering situation, the knowledge the vendor has acquired can be invaluable in implementation work.

At the present time, corporations are interested in finding vendors they can rely on to aid with business and technological change. When a vendor can point to in-depth experience with change and has relevant technical and business knowledge, there is less likelihood that assignments will be split between vendors. This is a strong reason for SI and PS vendors to expand the range of services they offer.

2. Vendor Selection Criteria

Factors in vendor selection are indicated in Exhibit III-8. Some of the lowest bids for an SI job are not even considered, based on the vendor's lack of relevant experience or inability to convey an understanding of the

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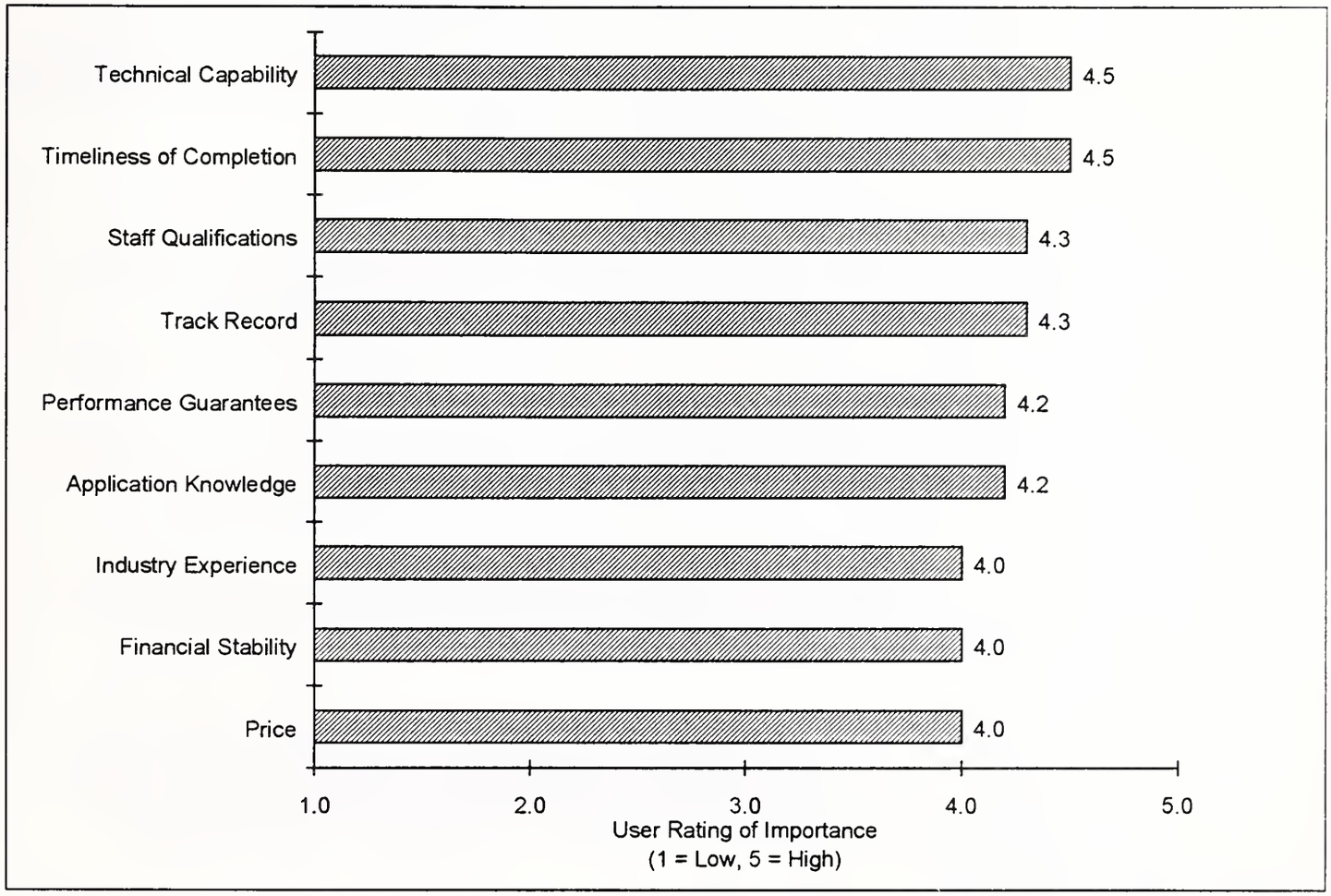
technology, process or problem involved. This places considerable pressure on the demonstration of knowledge and expertise.

Exhibit III-8

SI and PS Vendor Selection Criteria



Source: INPUT

Users report that all nine variables are roughly equivalent in importance; none dominate, as demonstrated by the close grouping of importance rating.

A key new trend is "technical capability" replacing "application knowledge" as the leading factor—the complexity of technology and number of solution options has finally overwhelmed the challenge of application knowledge. Sometimes users can assume some of the application knowledge burden in a project, but seldom can they deliver the full range of technical skills required for the dazzling array of technology choices.

The accelerated pace of global business has put a premium on timely solutions and completion. For example, a year late, world-class sales

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order entry system (integrated with finance and manufacturing) may not be considered worth the risk.

The relatively low position of price appears to contradict the earlier finding (shown in Exhibit III-6) that cost is the main concern of users with regard to using external vendors. This is explained by the focus that users now have on receiving *value* from the SI or PS project. This change will sometimes result in a lower-price project proposal being rejected in favor of a higher-priced bid.

3. Increasing Role of Users

Users and their management continue to be far more influential than before in determining the use of SI vendors. Their use of local IS capabilities has often expanded beyond obtaining data from the mainframe, to the point where changes to or segmentation of mainframe applications has been carried out to support their IS activities.

This type of experience creates an environment wherein, the user expects to be considered in the evaluation of both IS projects and vendors.

Users or their managers may also be interested in expanding or building local IS capabilities to handle some of their needs, and expect that concern to be addressed in bids.

Users, functional managers and executives will not only be interested in having application problems solved. They will also want to know *how* the problems are going to be solved, what role they will play in the solution and what capabilities they (the users) must have to help achieve the solution.

The pressure by top management to improve corporate results is the overriding reason for the increasing power of user areas. Processes in which users are involved must in response to these pressures. Users are pointing out or demanding changes that are necessary to bring about these improvements.

As a result, in many companies, users report that central IS managers and the CIO are able to steer them toward a carefully planned but unable to meet the desired timescales with internal resources. Users are demanding faster planning and implementation, and they report that these requirements are in line with senior management demands.

IS staff are being transferred to the user area to help users achieve corporate results. This is an important point to bear in mind for the PS vendor who concentrates on staff augmentation services. Traditionally, PS vendors sell to IS departments, but the channel to user departments is

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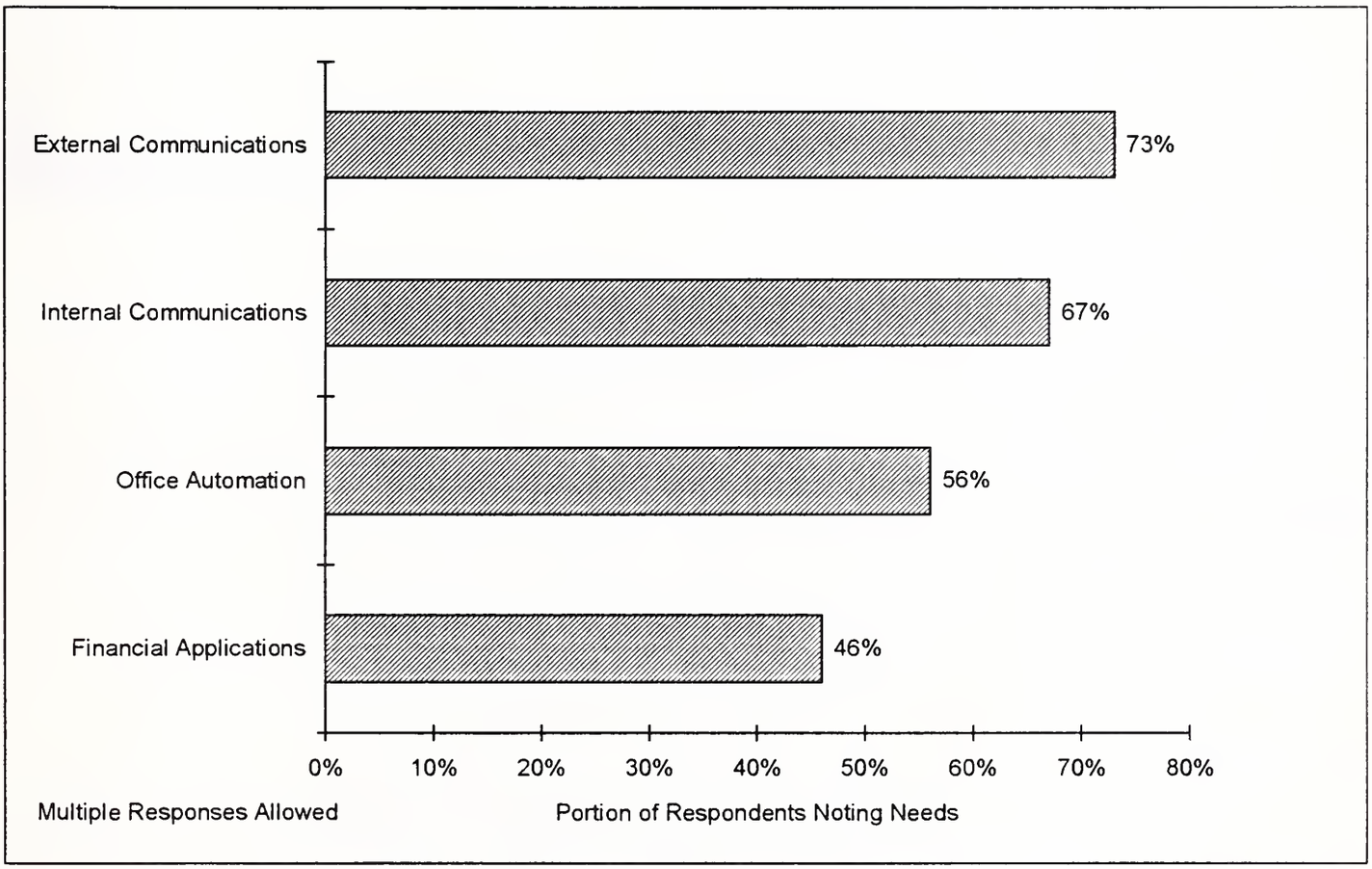
now available and will provide an alternative source of business in the future.

Users needs, by application area are shown in Exhibit III-9. There will continue to be a heavy emphasis on networking and communications-based applications.

Exhibit III-9

Key User Application Areas



Source: INPUT

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Market Analysis and Forecast

A
Market Overview

1. Definition of Services

So that consistency of forecasting is maintained, INPUT differentiates between professional services and systems integration services (called delivery modes) on the basis of the breakdown of the expenditure into various submodes.

Systems integration is a vendor service that involves providing a complete IT solution to a complex business problem. An SI contract includes submodes for hardware, software and professional services elements, and may also include activities such as environmental or wiring services, which are categorized as "Other." The SI vendor acts as a prime contractor by taking responsibility for the complete solution.

Professional services expenditure consists of expenditures on *only* people-based skills. These expenditures are applied to the submodes of consulting, software development, and training.

Many SI vendors are also PS vendors.

Exhibit IV-1 shows the defined submodes within each category of expenditure and identifies which ones are optional and which ones are essential for inclusion in each delivery mode.

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Exhibit IV-1

Make-up of SI and PS Contracts

Submode	Systems Integration Contract	Professional Services Contract
SI Submodes:		
Hardware	Essential	No
Software	Optional	No
Professional Services (not subdivided into consulting etc.)	Essential	No
Other	Optional	No
PS Submodes:		At least one of the following must be present:
Consulting	No	Optional
Software Development	No	Optional
IT Education & Training	No	Optional

Source: INPUT

In effect, to be categorized as an SI contract, the project (and related expenditure) must include vendor responsibility for both hardware and professional services.

Therefore, if a user anticipates giving one vendor the responsibility for the delivery of system or applications software plus some services, but does not include hardware, then INPUT will include the PS element in the PS forecast and the software expenditure in the appropriate systems software or application software forecasts.

The user expenditures that INPUT classifies as professional services are activities associated with the support of the use of information technology, including:

- Consulting
- IT Education and training
- Software development

In previous years, INPUT has also included applications management expenditures in the professional services forecast. However, the trend for applications management contracts to be long term (over one year) makes it more consistent for this type of service to be included in the outsourcing forecast. Expenditure in the U.S. on applications management services is forecast to be $0.7 billion in 1994 and growing at a 21% CAGR to reach

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$1.8 billion in 1999. So that consistency is maintained with previous years forecasts, this expenditure forecast is included in the figures shown in this report. However, discussion of this type of service is contained within INPUT's *U.S. Outsourcing Services Market, 1994-1999* report. In future years, applications management forecasts will not be shown in the systems integration and professional services report.

2. Project-Based and Staff Augmentation Services

All SI contracts require that the SI vendor take prime responsibility for the project. However, some activities delivered as part of a PS contract may have a similar requirement. INPUT refers to professional services such as these as "project-based services". Activities delivered as part of a PS contract where the control and management of the outcome are in the hands of the user organization are referred to by INPUT as "staff augmentation services".

Exhibit IV-2 provides a graphical representation of how the professional services portions of the SI and PS markets may be separated in terms of these two types of services.

Exhibit IV-2

Types of Professional Services Included in Each Delivery Mode

Type of Service	Systems Integration Delivery Mode	Professional Services Delivery Mode
Project-Based Service	Yes	Yes
Staff Augmentation Service	N/A	Yes

Source: INPUT

3. Systems Integration Overview

Systems integration (SI) continues to increase in importance as an information service for three key reasons:

- It is forecast to grow at a relatively fast rate (15% CAGR) and generating attractive margins (>20% gross margin) for leading SI vendors.
- It has become a necessary offering/evolution for most computer manufacturers, because SI contracts may involve the selection of computer hardware and related products.

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- It is a service that tends to generate or control the use of other information services, including software products, professional and network services and systems operations. In the case of systems operations, it is often necessary to provide an SI solution before an application or systems operation is outsourced. Thus the user expenditure must include an SI element.

4. Differences in Federal and Commercial Systems Integration and Professional Services Work

Many SI and PS vendors in the federal market are attempting to develop their presence in the commercial market. For that reason, it is important to understand the differences that exist in the nature of business in these two markets.

The interests of commercial clients can vary widely from one job to another. Federal SI jobs don't vary significantly, and they tend to have many more clearly defined common characteristics than do commercial tasks, as noted in Exhibit IV-3:

Exhibit IV-3

Characteristics of Federal versus Commercial SI

- More detailed requirements
- More standardized approach to SI (e.g., project office)
- More formal process
- Costly and open bidding process
- Different approach to marketing

Source: INPUT

- The federal customer usually has a more detailed set of requirements included in an RFP, and a vendor that has helped to develop those requirements will probably be excluded from bidding.

- Federal organizations establish program offices with experienced legal and technical staff members ready to administer SI contracts. Commercial organizations are generally less prepared to administer SI contracts and have to rely on more general, distributed capabilities to help.

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- There is a more formal process for evaluating bids and price, and the completion date and past performance are measured and compared more closely. A government agency maintains records of past performance on Department of Defense contracts. Laws also control what information can be disclosed to vendors during stages of procurement.

- The federal process and awards of contracts are more open than in the commercial sector. The requirement of competitive bidding for all jobs over $100,000 also is unique to the federal market.

- Marketing differs greatly between these markets. Upcoming solicitations for bids in the federal market are advertised in the *Commerce Business Daily*. Information on major programs is available in various documents. Commercial business depends on obtaining information about possible jobs from the sales force and other types of contacts. Commercial vendors may also cause companies to consider and initiate SI projects through presentations.

- Federal bids can be costly to prepare due to the complex process. The profit from jobs is tightly controlled and limited to 15% on fixed-price contracts. The federal government also can audit vendor records. Incentive or award fees can be used, however, to improve performance or schedules.

- Commercial profits can be and are generally higher, but the specifications for a job are not as rigid, so that commercial vendors can be exposed to the risk of lawsuits over performance.

- Substantial delays can occur in the lengthy and costly federal process, which can result in the need to reconsider the technology that has been bid or proceed with a solution that is not current.

Some commercial clients have incorporated aspects of the process in the federal and state governments for SI projects to provide more protection for critical undertakings.

5. Systems Integration and Professional Services Market Sectors

All SI and PS vendors focus on just a subset of the 15 vertical markets available because each market requires an investment of time and resources.

- Prospects seek, from prospective vendors, a high level of market problem knowledge and solution approaches in key application areas.

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- Prospects also seek a high level of experience with new technology in their market area. Vendors are forced to rapidly update their knowledge and experience when new IT developments appear.

As a result, many vendors serve only a few markets with SI and PS services. Even major vendors, such as EDS or Andersen Consulting, do not seek business in all vertical markets.

6. Systems Integration and Professional Services Vendor Classification

A wide range of firms are vendors in the SI and PS markets, and many of the vendors with the largest revenues from these markets, such as IBM and EDS, are also involved with other services (e.g., outsourcing). However, new groups of vendors are taking some of the share of this market—the software vendors and hardware distributors.

Software companies, such as Oracle Corporation and Sybase, are rapidly growing their PS businesses. The combined 1993 PS revenues for these two companies worldwide was over $500 million. INPUT believes that systems and application software companies will become major forces in the PS market over the next five years.

Distributors have become the most recent vendors to enter the SI market. Many large distributors are acting as SI vendors, particularly within the desktop arena, and they are also being used as subcontractors to large SI vendors for network-related services in large SI deals.

User organizations such as Chubb Insurance and American Airlines (which owns AMRIS) can and do set up subsidiaries to offer professional services training, consulting, or design and programming. Many of these vendors also offer SI and PS services in order to participate in the revenue and earnings growth of SI and PS.

Exhibit IV-4 shows, at an aggregate level, the portions of the combined SI and PS markets served by the different types of vendors in 1994 and the portions projected for 1999.

The increased presence of software companies, telecommunications companies and hardware distributors in the SI and PS market, plus the emphasis by ex-computer hardware manufacturers on SI and PS, will result in these companies having a higher rate of growth than professional service companies such as Andersen and EDS. They will also show higher SI and PS growth than the "Big 6" accounting companies.

This does not mean that these companies (Professional Services and "Big 6") will decrease in size, but that they will increase at a slower rate. The

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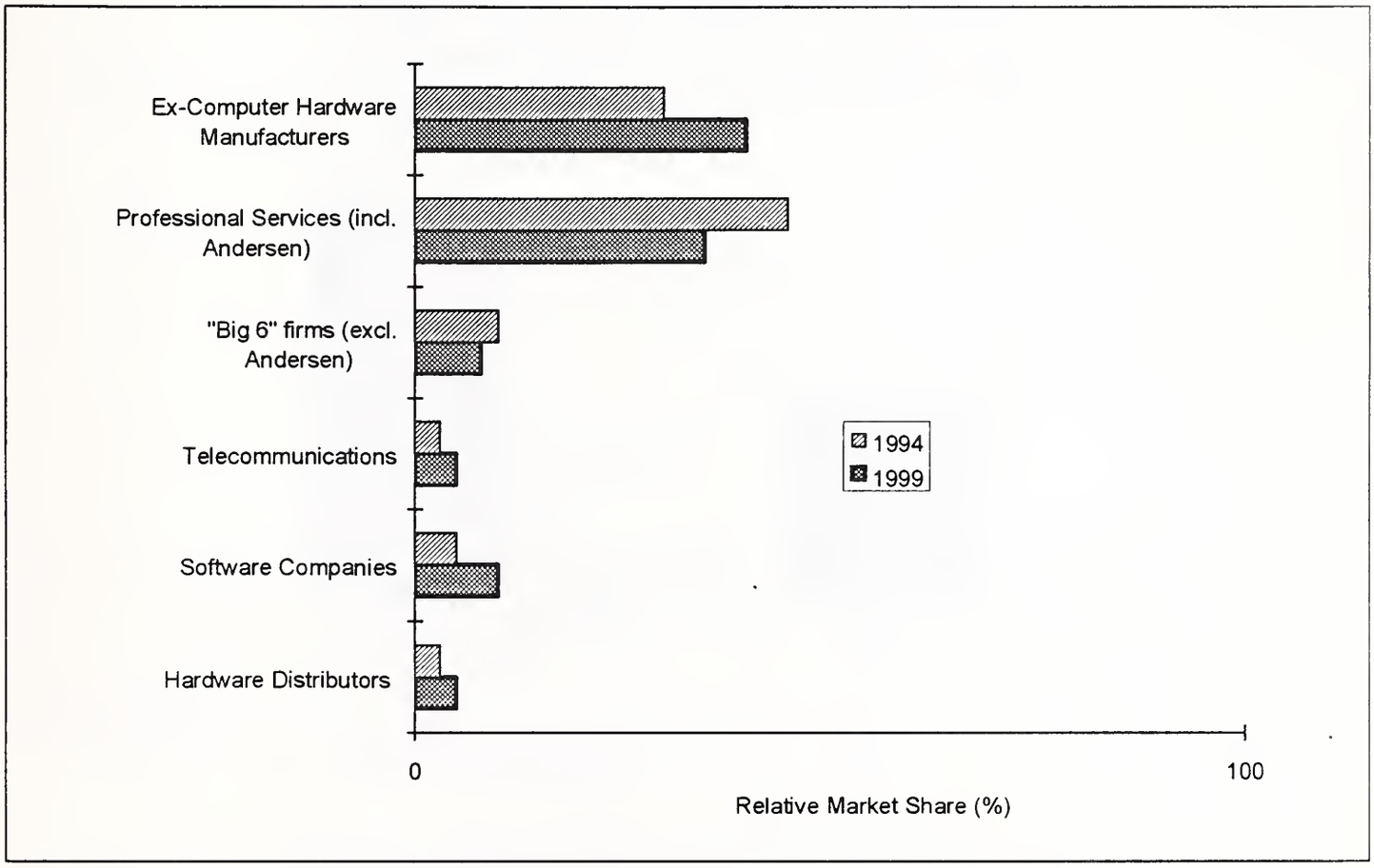
overall markets will still grow at an 11-15% CAGR, but the relative market shares will change.

Exhibit IV-4

SI and PS Vendors 1994-1999



Source: INPUT

B
Market Forecast

1. Continued Recovery of U.S. Systems Integration and Professional Services Markets

Due to the strong recovery from the recession during 1993, the SI market showed growth of 15% compared with INPUT's forecast of 14% growth. The PS market was also ahead of target with 11% growth compared with a forecast 10% increase.

- Users will continue to show more interest in projects that could improve their sales, earnings and productive capacity.

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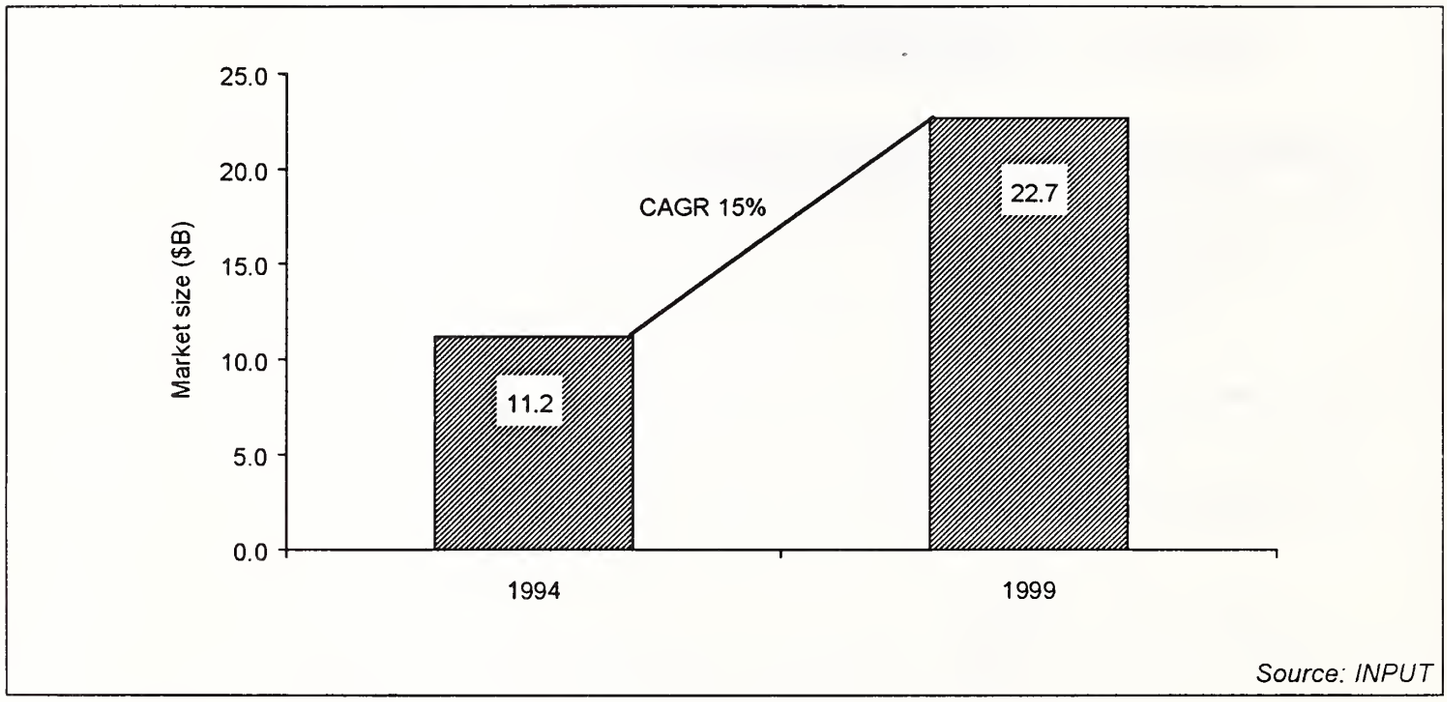
- Users are forecasting a more robust 15% CAGR for SI expenditures from 1994 through 1999, that will result in a level of $22.7 billion, double the 1994 base of $11.2 billion in expenditures, as shown in Exhibit IV-5.

Exhibit IV-5

U.S. Systems Integration Market, 1994-1999



Source: INPUT

The growth of SI expenditures will be uneven, however:

- The high-growth vertical markets are telecommunications, business services, discrete manufacturing, retail, and banking/finance, as indicated in Exhibit IV-6.
- The weaker verticals are utilities, state and local government, and process manufacturing.
- The federal market continues to be the largest SI industry market yet the market with the lowest CAGR (8%).

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Exhibit IV-6

Change in Five-Year SI CAGR

Vertical Market	1993-1998 CAGR (Percent)	1994-1999 CAGR (Percent)
Banking and Finance	21	21
Business Services	23	22
Discrete Manufacturing	20	21
Education	17	17
Federal Government	7	8
Health Services	18	19
Insurance	17	17
Miscellaneous	16	16
Process Manufacturing	15	15
Retail Distribution	20	21
State and Local Government	12	12
Telecommunications	22	24
Transportation	19	20
Utilities	10	10
Wholesale Distribution	16	16

Source: INPUT

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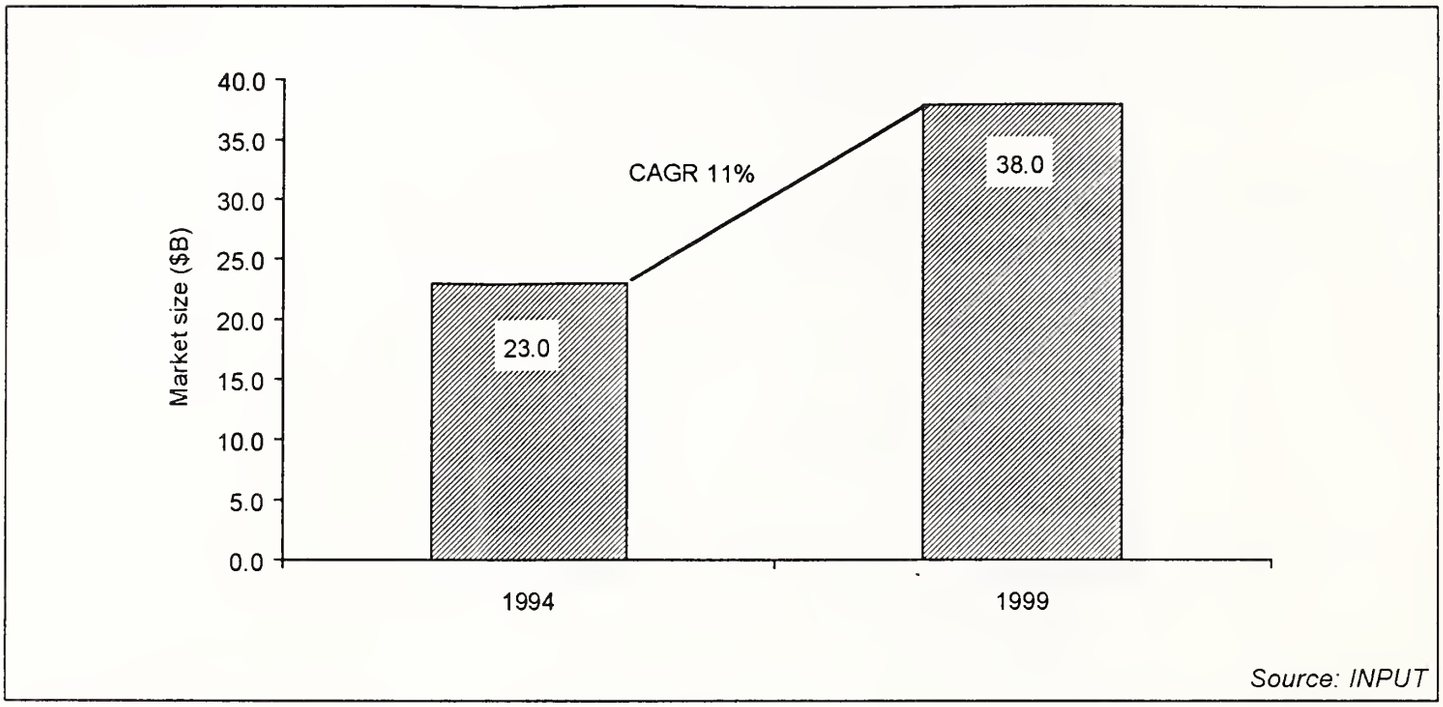
Professional services is a larger, slower growing market than systems integration. However, it is nearly twice the size, though growing at only 11% CAGR as opposed to SI's 15% CAGR (see Exhibit IV-7).

Exhibit IV-7

U.S. Professional Services Market, 1994-1999



Source: INPUT

When comparing the SI and PS vertical markets with the highest rates of growth as shown in Exhibit IV-6 and Exhibit IV-8. It is noteworthy that only one vertical (telecommunications) appears on both lists. For both systems integration and professional services it has the highest 1994-1999 CAGR of all vertical industries.

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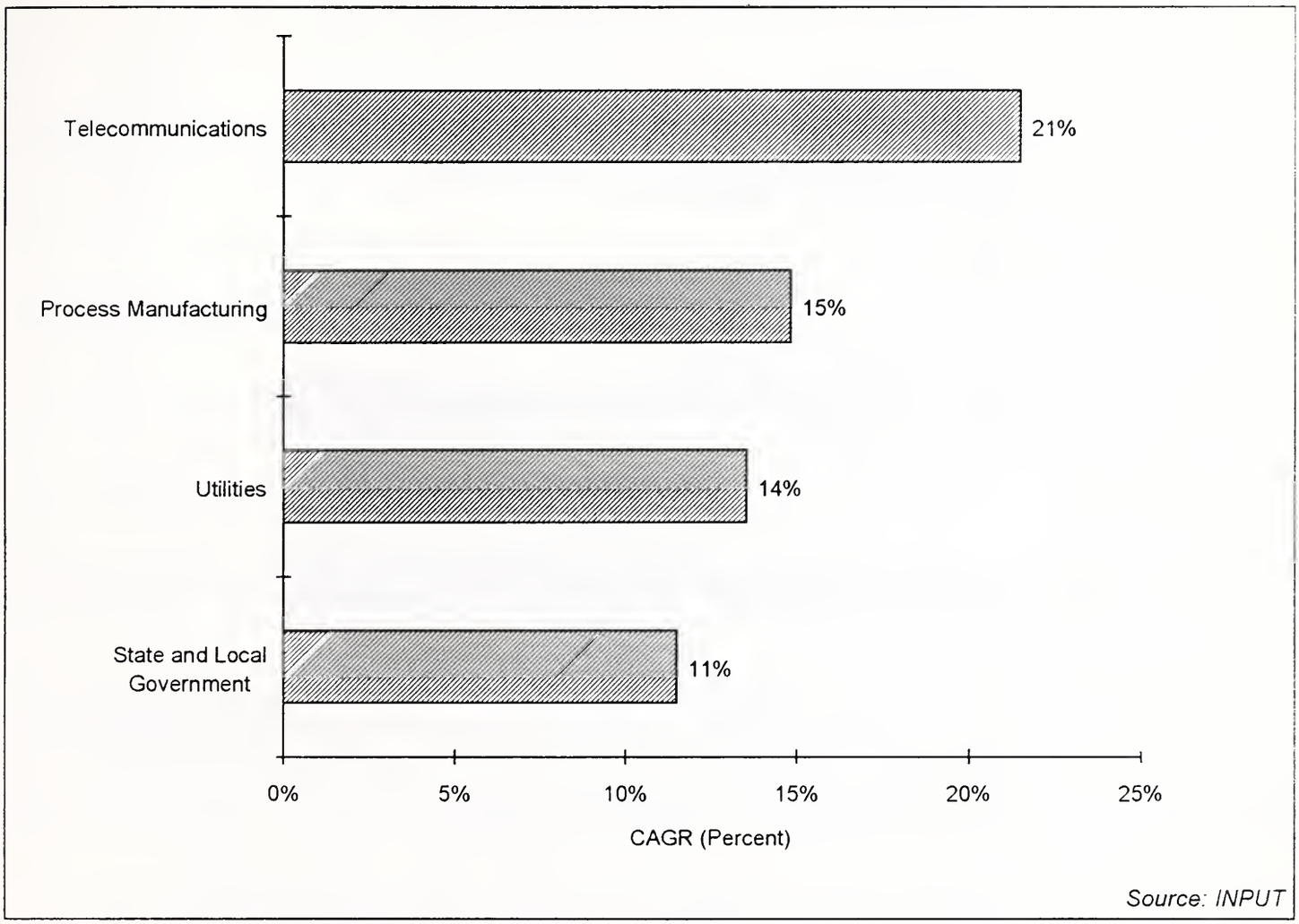
Exhibit IV-8

Fastest Growing PS Vertical Markets, 1994-1999



Source: INPUT

A more detailed discussion of each of the 15 verticals markets is offered in Chapter V and shows the forecast size of the markets as well as the factors that are driving and inhibiting the growth of SI and PS.

2. Forecast by Submode

Forecast SI expenditures by submode are shown in Exhibit IV-9. This exhibit gives a view of the combined federal and commercial markets. In both markets, expenditures for equipment and professional services are the most significant. However, expenditures for equipment are a larger percentage in the federal government than in the commercial market.

There is little difference in the percentage of SI devoted to software products and other services in these markets.

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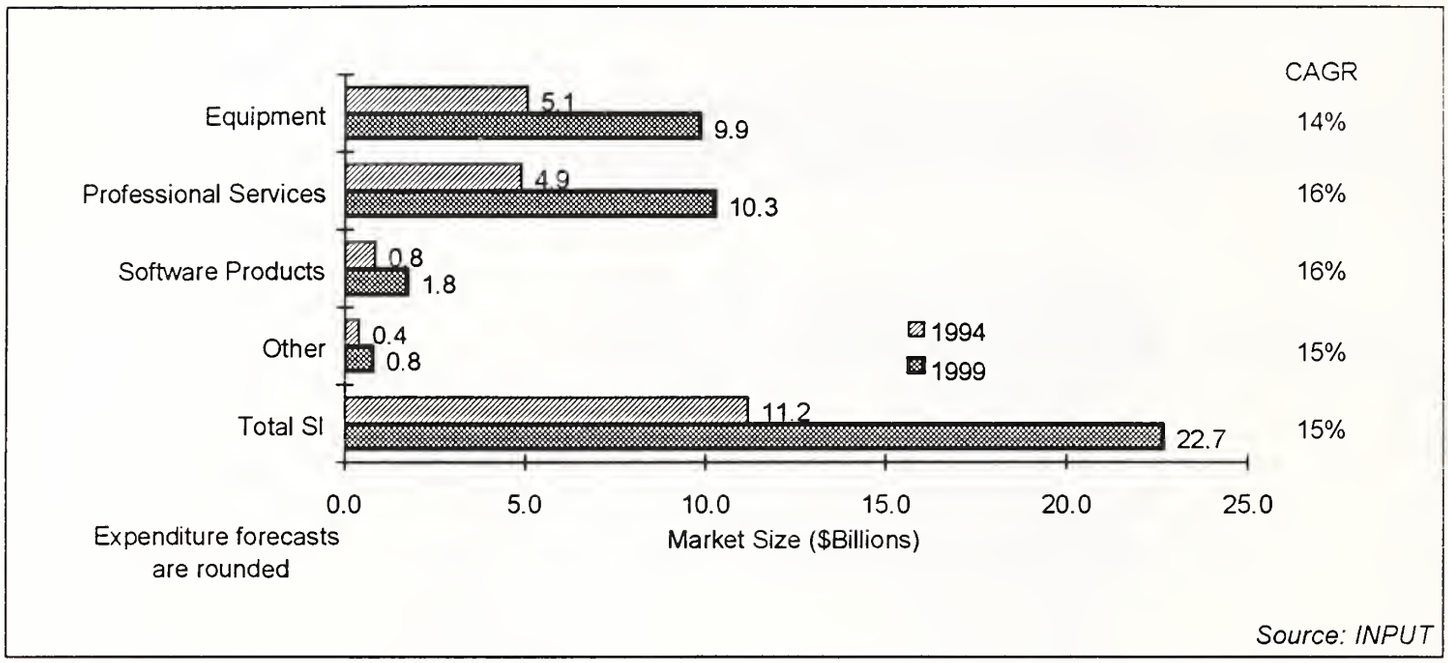
Exhibit IV-9

SI Expenditure by Submode, 1994-1999



Source: INPUT

Expenditure for equipment, computing and communications equipment is larger than other submodes in the federal government and in several commercial markets. In most commercial markets, expenditures for the professional services submode of SI is highest.

Although software products do not add a substantial amount to expenditures for SI projects, they can be critical elements because they may address vital parts of the solution—such as MRP or materials management in manufacturing, or trading systems in the finance and banking market. Many SI vendors, such as Andersen Consulting, AMS and TSC, have software products that are key components of solutions. This submode is forecast to grow faster than the others as software products emerge out of SI solutions and are replicated in functional and vertical markets.

Consulting, project management, customization and development are examples of activities included within the professional services submode of SI. The extension of consulting, to include BPR and other operational and technical planning, is the driver behind the 16% CAGR within this area.

Professional services submode expenditures are forecast in Exhibit IV-10. Software development represents half of the total market, but with a CAGR of 10%, is losing ground to the more rapidly growing IS consulting services (13% CAGR).

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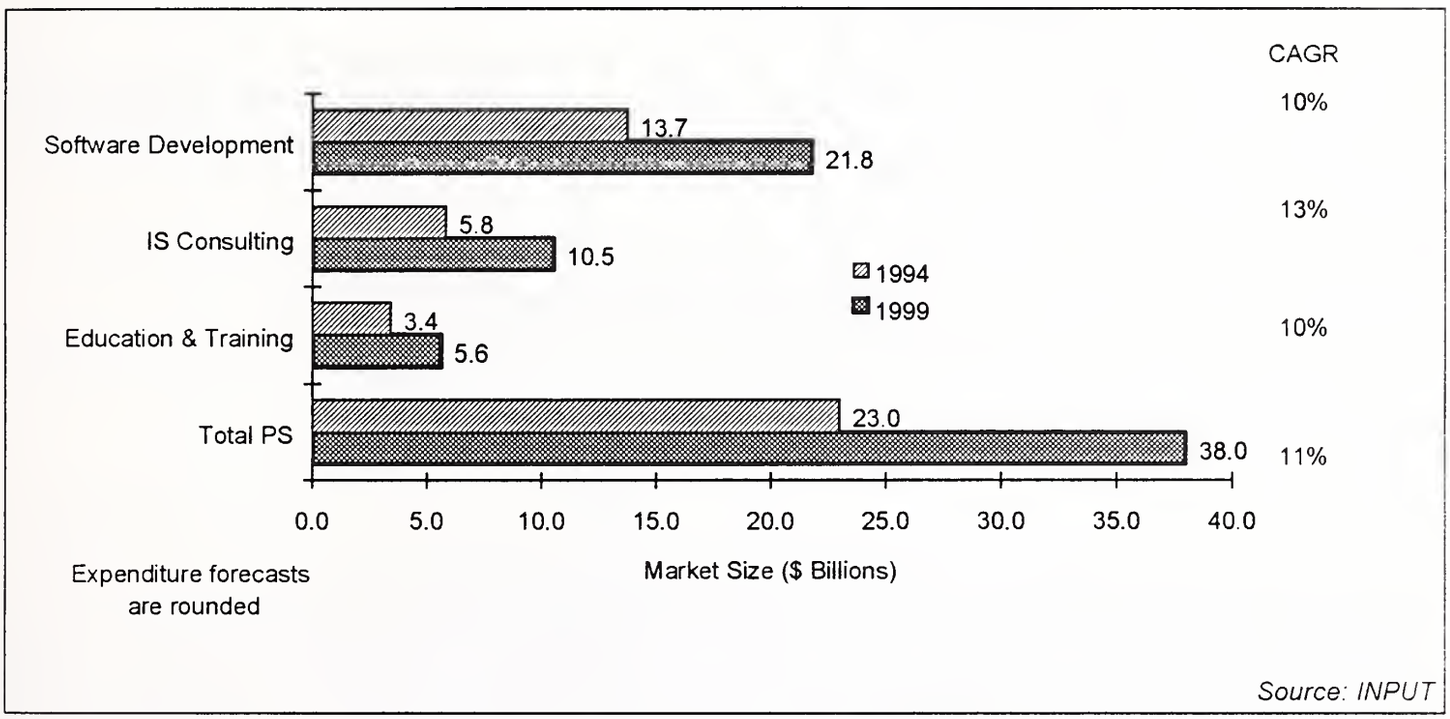
It must be remembered that although the growth rate for PS (11% CAGR) is less than that for SI (15% CAGR), the size of the PS market is far larger. INPUT forecasts the PS market to grow by $15 billion over the next five years, compared with $11.5 billion growth for SI.

Exhibit IV-10

PS Expenditure by Submode, 1994-1999



Source: INPUT

In general, software development work is driven to make application systems more responsive to business needs, to utilize new technologies in hardware and telecommunications, and to take advantage of new generations of software products. If the work is done on a specified application in accordance with a contract for over one year, in which the vendor will initiate tasks as required by users, the work would be referred to as application management, and is not included here.

The consulting segment of professional services includes the following types of work:

- Business process reengineering
- Operational planning (when related to IT)
- Software installation
- Information systems audit

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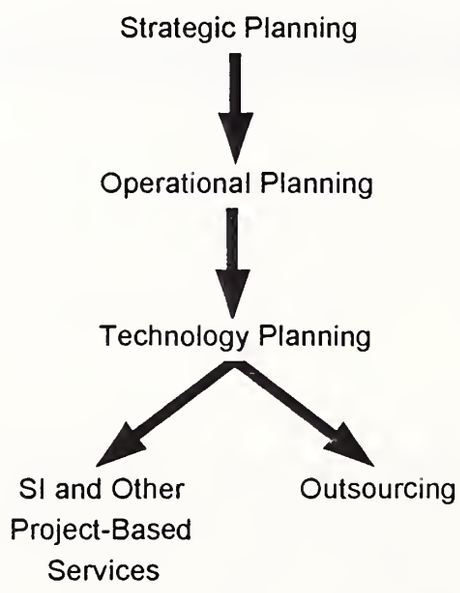
- Personnel planning
- Policies and procedures development
- Network planning and design
- Information systems strategic planning
- Systems analysis

Often in client engagements there is a chronological flow of business opportunities that offers an advantage to vendors capable of participating early in the process (see Exhibit IV-11).

Exhibit IV-11

Consulting Business Opportunity Flow



Source: INPUT

In addition to the growth of IT consulting services, many professional services and SI vendors are experiencing a growth of management consulting services. Part of this growth comes from the sale of BPR consulting services by firms such as Andersen Consulting, CSC, EDS, Unisys and IBM. The BPR business is of interest not only for the large fees that it generates, but also because it will often lead to large SI or professional services projects.

The growth of education and training has been stimulated by the introduction of client/server technology. Companies such as Andersen

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Consulting and EDS have strengthened training in this area in order to deliver trained resources into the rapidly growing number of C/S project opportunities.

However, interest in C/S has also led to the introduction of many low-cost training options and diluted training dollars previously devoted to education-related mainframe software products.

C
Competitive Environment

1. Market Shares

The leading SI and PS vendors are shown in Exhibit IV-12 with estimated revenues and combined SI and PS market share for 1994. These industry-leading firms have achieved that status by emphasizing and riding the higher growth systems integration market.

Exhibit IV-12

1993 U.S. Revenues of Major PS and SI Vendors

Vendor	Prof. Services Revenue ($M)	SI Revenue ($M)	Market Share of Combined SI & PS Markets
IBM	575	2625	10%
EDS	800	725	5%
CSC	650	675	4%
Andersen Consulting	300	775	3%
DEC	175	700	3%
Unisys	175	625	3%

Source: INPUT

2. Vendor Strategies

The future success of these leading vendors is dependent upon the need for an ever-expanding range of service offerings. Exhibit IV-13 shows INPUT's opinion of the range of services offered by these industry leaders.

Traditionally, SI activities are specified in terms of application functionality. However, SI projects driven by BPR efforts emphasize business results and have a less precise functional specification but an increased scope of operation due to the crossing of functional boundaries. Relationships developed here, especially with functional users, enhance the probability of winning follow-on business.

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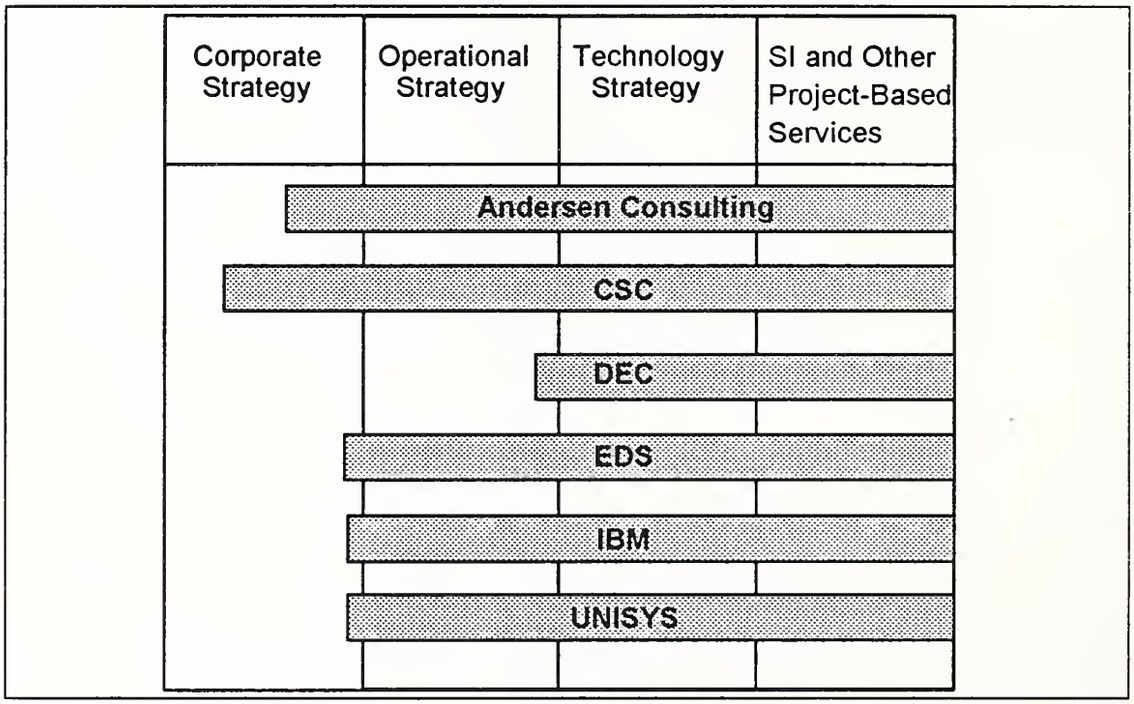
Another advantage can accrue to vendors strong in the BPR area. When users employ different firms for the BPR and technology implementation phases, they often get mixed messages from conflicting vendor views in the technology strategy area. The resulting user confusion is often solved by a preference for a single-vendor solution.

Exhibit IV-13

Service Spectrum of Leading SI and PS Vendors



Source: INPUT

Note: The position of DEC reflects its move to focus on systems integration and professional services and to de-emphasize the strategic consulting side of the business.

As these leading vendors expand to higher margin board-room BPR consulting work, they miss many user/department-level smaller jobs—a significant part of the client/server market. The result has been the birth of many local and regional small systems integrators specializing in C/S solutions. To the industry leaders, these smaller vendors offer opportunities for partnering and acquisition.

3. SI Vendor Pricing and Contracting Strategy

Users' perceptions about risk are reflected in their preference for various approaches to contract pricing. As shown in Exhibit IV-14, users clearly prefer fixed-price contracts when possible.

Fixing the price at the beginning of the project, at least on the surface, certainly reduces the financial risk (to the users) associated with an SI

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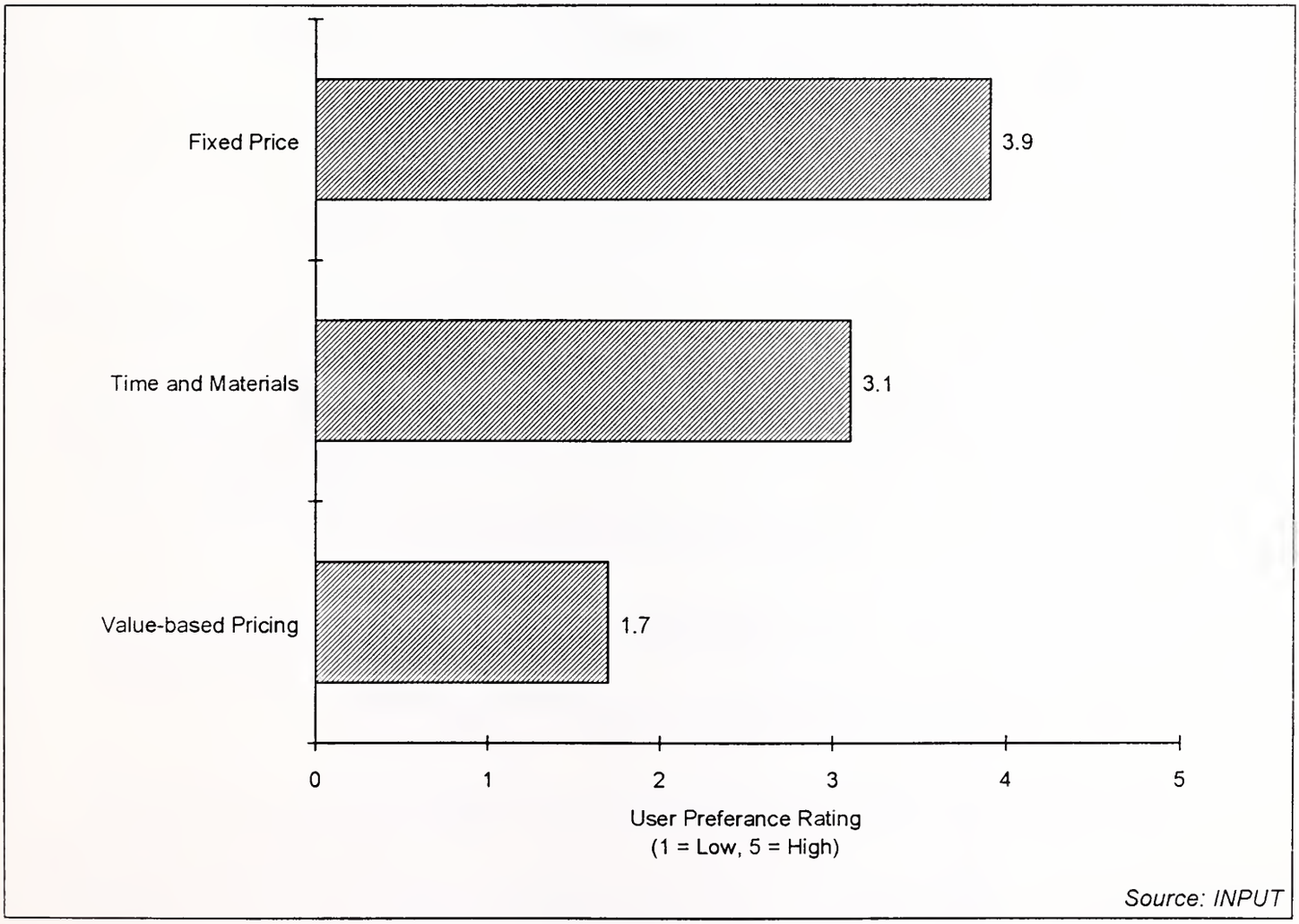
effort, and clearly appears to be a reasonable strategy when the scope of the effort is extremely well defined. However, it does have some disadvantages.

- In situations where the vendor senses high levels of risk that are either denied or ignored by the prospect, vendors will factor the risk into the pricing, thus increasing the cost to the buyer.
- Fixing the price will clearly reduce the vendor's interest in being flexible with regard to changes in specifications, etc.
- When unanticipated events develop during the project that require midcourse adjustments in the level of resources or changes in schedules, the fixed-price approach can be a barrier to effective negotiations. This may turn the partnership into a potentially adversarial relationship.

Exhibit IV-14

User Pricing Preferences



Source: INPUT

Regardless of the approach used to assess risk, the vendor's price is going to reflect the assumption of risk. Exhibit IV-15 shows the proportion of

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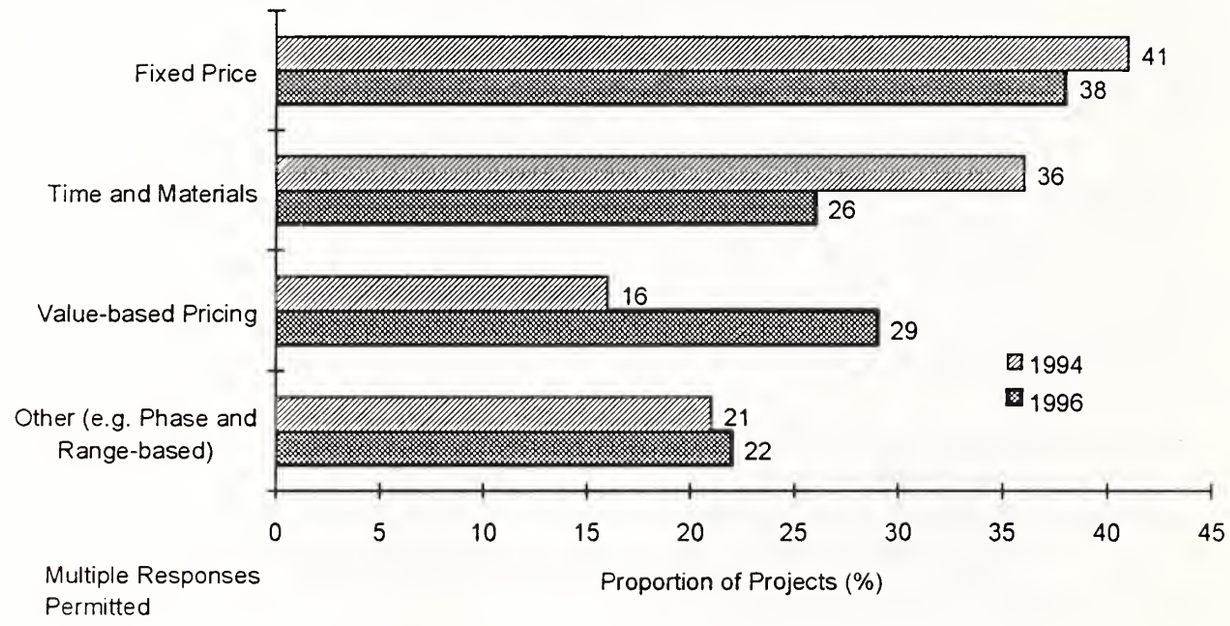
contracts negotiated under the fixed-price, time-and-materials, and value-based approaches. The average responses for 1994 and a two-year projection (1996) are shown.

Exhibit IV-15

Proportion of Vendor Projects Using Various Pricing Approaches: 1994 and 1996



Source: INPUT

In general, the proportion of usage in the exhibit is consistent with the user preferences for contract types shown in Exhibit IV-14. That is, the relative use of fixed-price, time-and-materials, and value-based contracts cited by vendors is in the same rank order as user preferences for these types of contracts: 3.9 for fixed price, 3.1 for time and materials, and 1.7 for value based when rated on a scale of 1 to 5.

However, vendors anticipate a significant shift in the mix over the next two years with a more than 80% increase in the usage of value-based contracts, largely at the expense of in time and materials engagements. This shift is attributable to a number of influences:

- A growing number of projects involving business reengineering efforts identify large pools of cost savings or profit improvements. In most instances, implementation will require major systems changes resulting in large systems integration opportunities. By linking some portion of their profit margin to a percentage of the savings or improved profits, vendors accomplish two objectives:

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- Because the potential savings or profit improvement related to a major business reengineering effort is typically large, being rewarded with even a small percentage of the total dollar benefits can create profit potential well in excess of that usually achieved on a standalone SI project.

- The larger profit potential generated by value-based contracts provides a more substantial cushion to cover the potential risk, and provides an incentive for outstanding performance on the part of the project team.

  Given the potential benefits, vendors will continue to push for value-based pricing where business reengineering or other situations create the right opportunity.

- Although fixed-price contracts pose the highest risk to the vendor, they clearly are the buyers' preferred method of doing business. Therefore, as indicated in Exhibit IV-15, it is unlikely that vendors will be able to reduce user interest in fixed-price contracts. However, they may be able to convince users to share the financial gains associated with business reengineering-based projects by offering lower fixed prices and introducing an element of value-based pricing.

However, the degree to which vendors can convert users to value-based pricing is still an open question. Vendors who offer a full spectrum of services, such as EDS and Andersen Consulting, claim high levels of success with this approach. The growing number of business reengineering efforts under way will create additional opportunities. However, with an average-interest level in value-based pricing of 1.7 on a scale of 1-5, users do not appear to be expressing much enthusiasm for the concept at the moment.

The major trends impacting contracts are:

- An accelerating shift from time-and-materials pricing to value-based or other incentive-based approaches.

- A movement toward pricing schemes such as range based and phase fixed, which encourage risk sharing (with or without incentive clauses) and acknowledge at the start of a project that there may be elements of risk that simply cannot be properly estimated in financial terms.

  A range based pricing agreement establishes a bandwidth of prices for one or more of the phases. From a user's viewpoint, this approach has the advantage of putting a ceiling on the price almost regardless of contingencies.

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Phase fixed pricing is most popular in situations where a vendor is brought in prior to the generation of any detailed specifications, or when the project will involve the application of leading edge technology. In these cases, there are too many unknowns to fix the price for the entire engagement the start. Instead, a fixed price is established for the first phase and rough estimates for the follow-on phases. As one phase is completed, fixed prices are established for one or more of the subsequent phases. This form of pricing is well suited to SI projects that are generated by BPR activities, particularly in those cases where the BPR vendor is also the SI vendor.

- A growing tendency to include detailed contract specifications for user resource requirements down to the level of phase and task.

- The use of joint venture development efforts between buyers and vendors to deal with extremely high-risk projects involving advanced or unproven technology.

Exhibit IV-16 lists the major trends in SI and PS contract pricing and gives INPUT's assessment of their potential benefits and impacts.

Exhibit IV-16

Trends in SI and PS Contract Pricing

Trend	Impact/Benefit
Shift to value-based and incentive pricing	Increased incentive for SI and PS vendors to apply innovative approaches Improved partnership relationship Lower user costs to cover risk
Movement toward range based and phase fixed pricing	Objective recognition of the inability to define certain elements of risk Lower costs to user and an inducement to user participation in the partnership
Contractual commitment to user involvement	Insures user resources will be available to meet contract commitments Increases sense of partnership and participation
Joint venture for leading-edge efforts	Formalizes the concept of risk sharing with shared benefits Promotes user involvement in the design process

Source: INPUT

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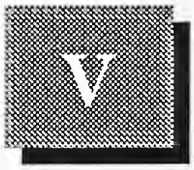

Vertical Markets for Systems Integration and Professional Services

This chapter provides an overview of the size, growth and factors influencing the growth of the combined SI and PS markets for each of the 15 vertical markets tracked by INPUT. The vertical market analyses are presented in alphabetical order.

The driving and inhibiting factors are presented in bullet form only; a more detailed discussion of each of these markets is available in the annual vertical market forecasts published by INPUT. These vertical market reports include discussion of all the delivery modes in the IS market.

A Overview

Vendors of project-based services orient their offerings to target vertical markets more than do vendors of staff-augmentation services. Vendors provide solutions to business problems in a particular market by using a combination of industry knowledge and the ability to integrate information services and technology. The service could involve cross-industry applications, such as accounting, as well as vertical market application systems, but the service is oriented to the problems in a specific vertical market, or a niche within that market.

Systems integration started in the federal market, which is still the largest market for this delivery mode.

As the federal SI market grew in size and vendors realized the potential for this approach to business problems, they began to offer the service in other vertical markets. Some of these markets, such as discrete

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manufacturing, have used the service for many years, but in others, the service is not as widespread.

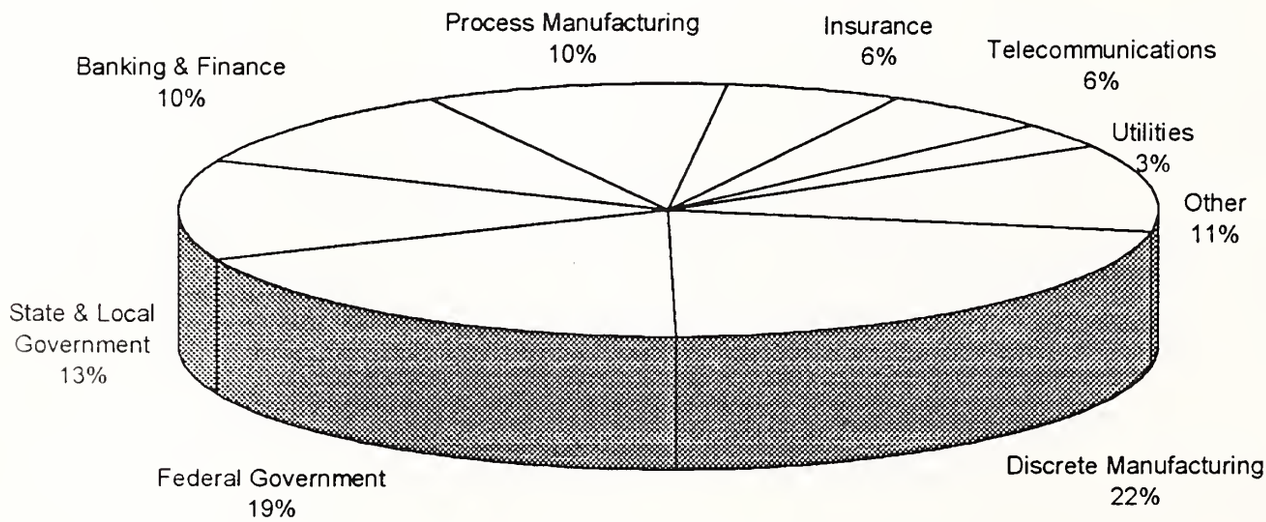
SI vendors are generally identified with the markets in which they can provide solutions; as Andersen, CSC and TSC are in manufacturing, EDS and AMS are in banking and Unisys is in airline applications. Most of the vendors named have SI business in multiple vertical markets, but some, such as SCT, have successfully found solutions focused on only a small section of the overall market.

The relative size of the combined SI and PS market, split by vertical industry, is shown in Exhibit V-1. This business is dominated by government (federal plus state and local) and the discrete manufacturing industry, which account for 54% of all SI and PS expenditures. Thirteen other industries make up the other half of the market. Appendix A identifies the SIC codes included in INPUT's industry segmentation.

Over the next five years, INPUT forecasts a slightly more even distribution of expenditures. This will be led by growth in the telecommunications and "other" market segments and a decline in the Federal segment share. Discrete manufacturing will continue to have the major portion of SI and PS expenditure.

Exhibit V-1

Spread of SI and PS by Vertical Market in 1994



Source: INPUT

The following analysis of vertical markets will address some of their current differences and opportunities.

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B
Banking and Finance

1. Overview

Banking and finance SI and PS expenditures are shown in Exhibit V-2. Professional services are four times as large as SI today, but SI is growing almost three times faster.

Systems Integration Analysis

Systems integration expenditures are forecast to grow at 21% annually, to a level of $1.8 billion by 1999.

Demand for complex new projects requiring SI will grow as the pace of bank mergers, consolidations and reengineering of the IS environment begins to increase. The services of systems integration firms will be increasingly important to guide newly merged commercial banks through the complexities of systems consolidation, the implementation of client/server systems, and the linking of new technology systems to old legacy systems.

Strong and aggressive non bank financial services firms are expected to make continuing large systems investments, providing some specific niche opportunities for systems integration firms. However, as these firms are relatively few in number, their impact on this market will be relatively small.

Professional Services Analysis

Professional services expenditures are forecast to grow at a modest 8% CAGR to $4.3 billion by 1999.

This reflects a continued emphasis on expense control (outside services are typically reduced before in-house staff is cut). Most expenditures will be for traditional contract programming and maintenance of older systems.

One exception to this trend is found in institutions that are adopting CASE tools and/or implementing client/server technology. In both situations there is an opportunity for vendors with specialized skills to provide development support and training for in-house staff. This will be especially true with larger institutions, whereas the smaller institutions are more likely to use the expanded services of a systems integrator, letting someone else assume the management responsibility for implementing these new systems.

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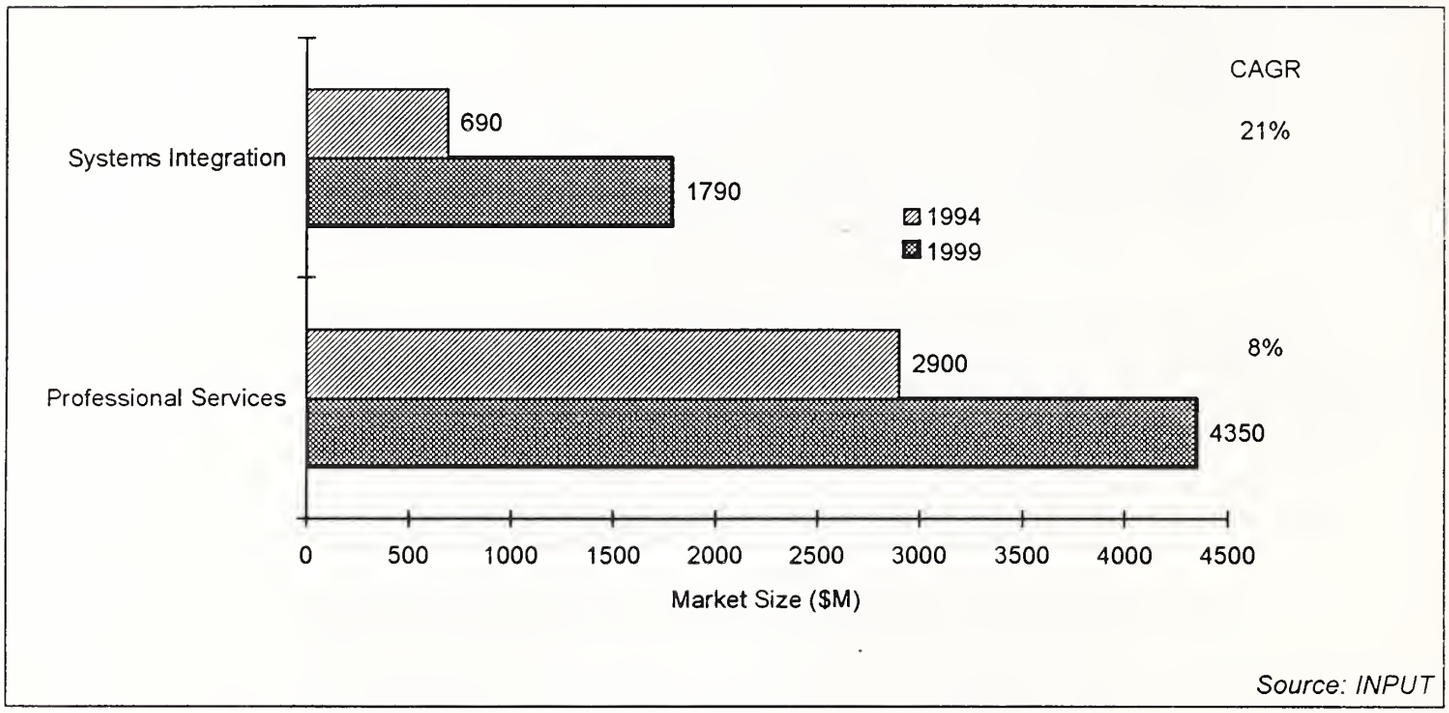
Exhibit V-2

PS and SI in Banking and Finance



Source: INPUT

2. Driving Forces

- Mergers and acquisitions generate demand for services
- Competition from non banks
- Introduction of new technology

3. Inhibiting Factors

- Regional uncertainty regarding impact of defense and health care changes and expenditure
- Overcapacity in the banking industry

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C
Business Services

1. Overview

Business services expenditures are shown in Exhibit V-3. The SI market is over 20% CAGR smaller than the PS market (approximately $300 million compared to $380 million) yet SI is growing three times as fast as professional services and is expected to be the larger market by 1997. This growth forecast is due largely to an improved economy and its impact on real estate, travel, entertainment, recreation, repair services, and personal/professional services.

Systems Integration Analysis

Systems integration expenditures are forecast to grow at an aggressive 22% annually to $800 million by 1999. Forecast growth represents prospects in business services for PC/workstation platform and specialized applications software integration. The professional services component, as the largest delivery mode, represents the umbrella under which many systems integration services are offered. Systems integration expenditures typically represent large contracts only. INPUT assumes that only the large business services companies will use systems integrators over the forecast period.

Professional Services Analysis

Professional services are forecast to grow much slower, at 7% annually, to a 1999 level of $500 million. Market trends that will fuel growth in expenditures for professional services include the following:

Companies like Andersen Consulting and Electronic Data Systems continue to seek and derive profit from business services consulting, which is becoming an increasingly viable delivery mode.

Software development will continue fulfilling a need for the multitude of business services companies that provide specific and specialized services, such as museums, galleries and funeral services.

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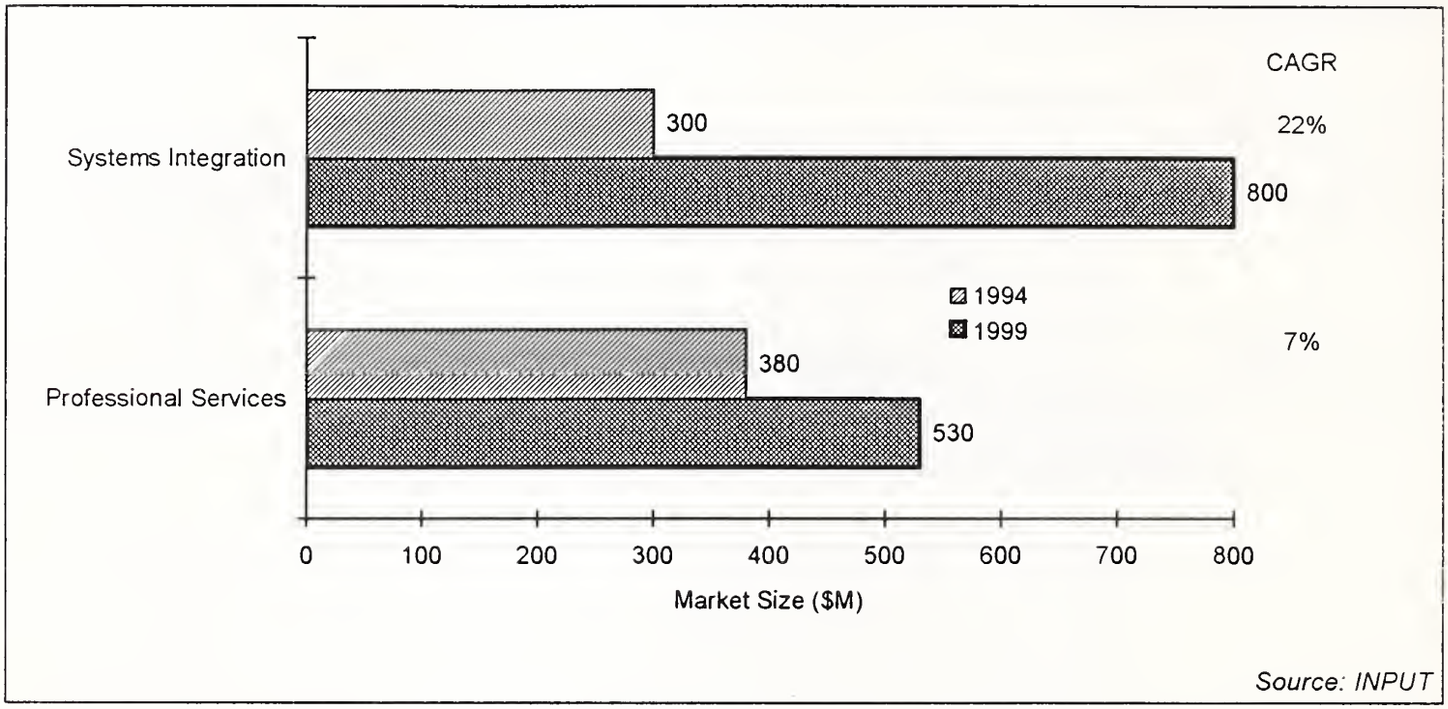
Exhibit V-3

PS and SI in Business Services



Source: INPUT

2. Driving Forces

- Improvement in the U.S. economy
- Need for innovative services and marketing strategies (with new underlying technology to deliver them)
- Need for internal efficiency (e.g., via client/server applications, databases, networks)

3. Inhibiting Factors

- Internal cost control pressures
- Strong in-house control of IS
- Many small enterprises with limited IS budgets

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D
Discrete Manufacturing

1. Overview

Discrete manufacturing SI and PS expenditures are shown in Exhibit V-4. Systems integration is smaller, but growing at three times the rate of professional services.

Systems Integration Analysis

The systems integration market shows a 21% CAGR through 1999, reaching almost $5 billion in that year. The importance of systems integration at present cannot be overstated. The "legacy" buildup of islands of automation and information is a deterrent to the success of a reengineered business. Systems integrators enjoy growth in a market that requires specific knowledge in multiple disciplines, a knowledge that is seldom available in-house.

Professional Services Analysis

The largest category of information systems expenditures is professional services. At $5.6 billion in 1994, and growing at 7% CAGR throughout the forecast period to $7.9 billion in 1999, it represents a substantial market. INPUT has revised the growth rate during the forecast period, down slightly to 7% CAGR from the 8% CAGR figure in the 1993 report. The strong growth expected in packaged software and systems integration in this sector will come at the expense of staff augmentation services.

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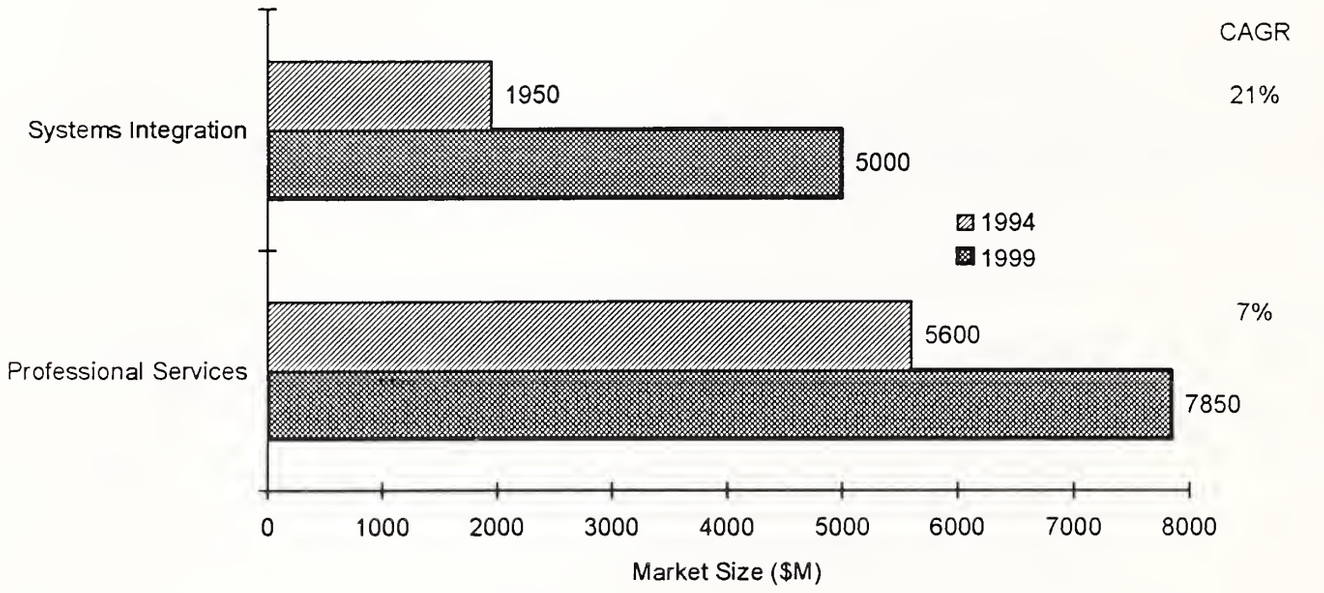
Exhibit V-4

PS and SI in Discrete Manufacturing



Source: INPUT

2. Driving Forces

- Growth of business process reengineering (BPR)
- Competition between vendors
- Demand for increased computer expertise in users' functions

3. Inhibiting Factors

- Customization of solutions reduces potential for replication of services
- Vendor sales personnel focus on product features and functions instead of emphasising the use of technology to support business processes
- Lengthier and more complex buying process

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E
Education

1. Overview

Education SI and PS expenditures are shown in Exhibit V-5. The two service modes are currently approximately equal in size, but SI is growing faster. There is continuing budget sensitivity in all education markets due to reductions in state aid and federal grants.

Systems Integration Analysis

Systems integration expenditures are forecast to grow at 17% annually to $300 million by 1999. One reason for the high growth expectation for systems integration in the educational market is the continuing need for providing intra- as well as inter-campus networking capabilities—tasks which typically involve integrating diverse computers, operating systems and network architectures. At the K-12 level, there is also a growing need to interconnect local schools with district headquarters, as well as a requirement for providing interactive courseware delivery to improve curriculum quality and cost effectiveness.

In higher education, the use of outside systems integrators is limited. Contributing factors include the perceived high cost of long-term contracts, a desire to maintain integration control, and a slow movement toward distributed applications. Currently, much of the use of campus networks, especially for E-mail and interdepartmental file exchange, is accomplished through a college or university's mainframe hosts.

Professional Services Analysis

Professional services expenditures are forecast to grow at a modest 10% annually to nearly $200 million by 1999. The educational professional services market consists primarily of services provided at the higher education level in association with sales of administrative software and custom software development. In particular, as software solutions become more complex there is an increasing need for consulting, education and training support services.

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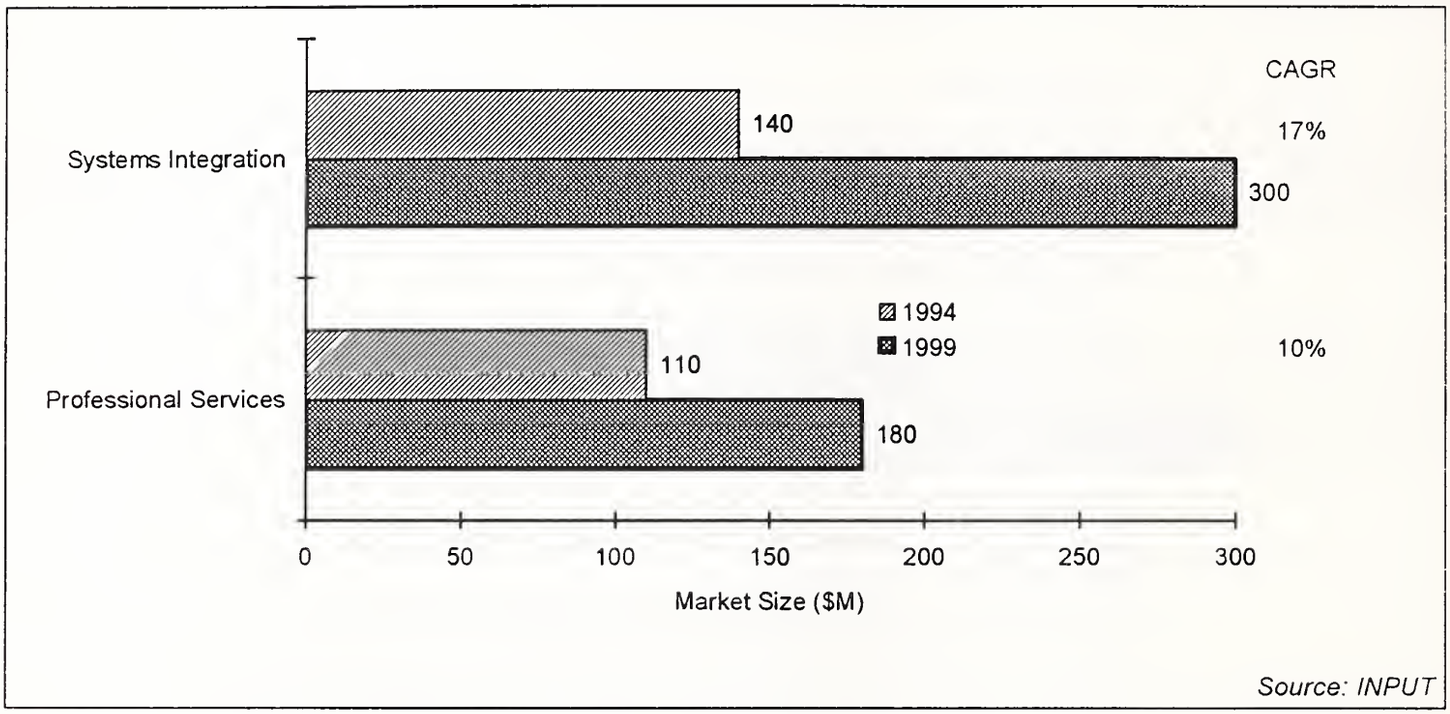
Exhibit V-5

PS and SI in Education



Source: INPUT

2. Driving Forces

- Increased higher education enrollment
- Increased voter willingness to fund public education
- Tuition increases and corporate sponsorship of educational programs and resources

3. Inhibiting Factors

- Risk averse/noncompetitive environment
- Limited funding
- Institutional priorities in other areas
- State and federal funding cuts

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F
Federal Government

1. Overview

Federal government SI and PS expenditures are shown in Exhibit V-6. SI is only slightly larger than professional services and both are growing modestly in the 8-9% CAGR range. The Administration and Congress continue to believe in the payoff from data processing investments, and scaling back has only been witnessed in defense-related projects.

Systems Integration Analysis

Federal SI expenditures are forecast to grow at 8% annually to $5.5 billion by 1999. Unlike commercial markets, hardware outlays are the predominant investment, as agencies replace, modernize, and acquire additional systems. Procurement emphasis will be on distributed hardware such as workstations, PCs, LANs and network management equipment.

Federal projects tend to be communications intensive today. Civilian SI spending exceeds that of defense by $2 billion. Defense will continue to lose ground to civilian market demand over the forecast period.

Professional Services Analysis

Professional services expenditures will grow 9% annually to $4.2 billion by 1999. The huge base of historic government business and tradition of using outside professional services has made the federal government the largest user of professional services in the U.S. Dependency on outside contractors makes this a relatively stable market.

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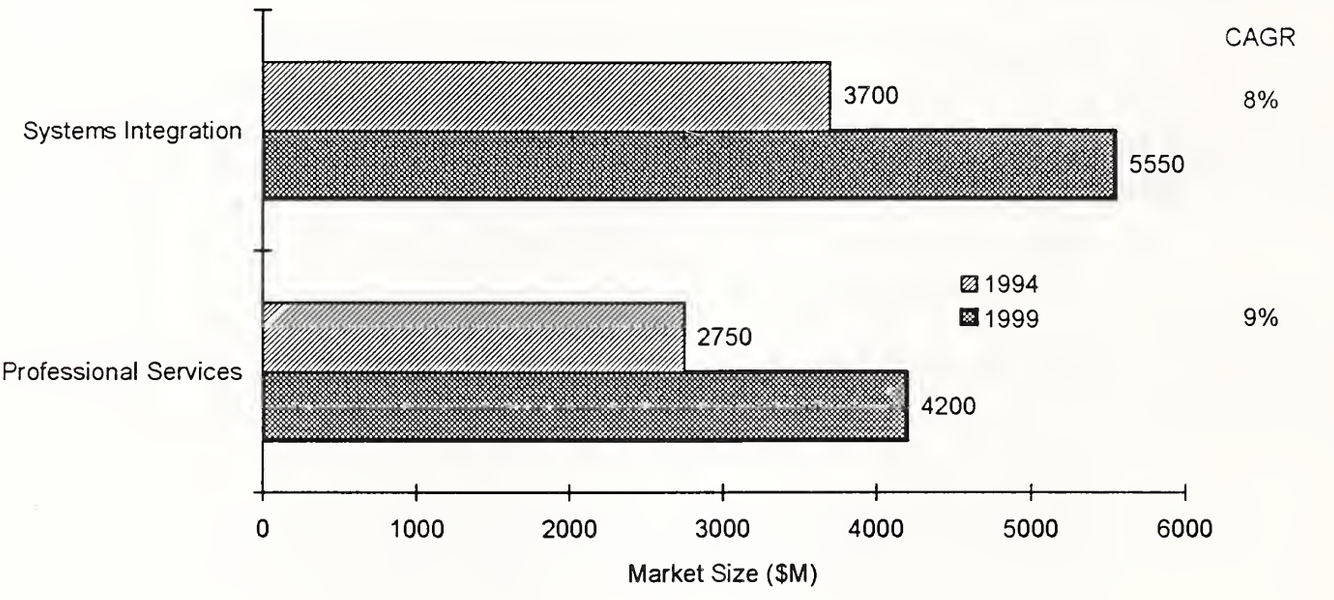
Exhibit V-6

PS and SI in Federal Government



Source: INPUT

2. Driving Forces

- Need to upgrade systems
- Administration and congressional support (given demonstration of project benefits)
- Declining in-house IS skills
- End-user demand for training and education

3. Inhibiting Factors

- Federal budget funding limitations (cut-back pressure)
- DoD cut-back pressures

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G
Health Services

1. Overview

Health services SI and PS expenditures are shown in Exhibit V-7. Today, SI and professional services are the same size, but over the next five years SI will grow at nearly twice the PS rate. This is based on a fundamental assumption that health care reform will require greater amounts of information for determining the cost of health care delivery for providers and payers.

Systems Integration Analysis

Systems integration expenditures are forecast to grow at 19% annually to $900 million by 1999. This is primarily driven by the difficulty health care institutions have in managing large, new-systems projects internally, given the complexity of today's information services technology, the pressure to adapt to managed care, and the accelerating pace of technical change in health care information systems. This is especially true for those new projects requiring a combination of in-house and outside resources and for the potentially overwhelming challenge of integrating "islands of automation" across a number of associated institutions providing a continuum of care. Network and data integration across the enterprise are major requirements.

Professional Services Analysis

Professional services expenditures are forecast to grow at a modest 10% CAGR to $600 million by 1999. Until recently, this has been dominated by the industry's leading turnkey systems suppliers. Professional services were originally bundled into the price of the total deliverable. The tendency among such vendors today is to unbundle the pricing.

Much of the professional services emphasis is on application customization, education and training, and systems integration across diverse information systems platforms.

Opportunities for "independent" professional services/consulting firms lie more with business process re-engineering and consulting on how health care institutions can make the necessary changes to be competitive in a managed care environment. Partnering with some of the leading product providers should be considered.

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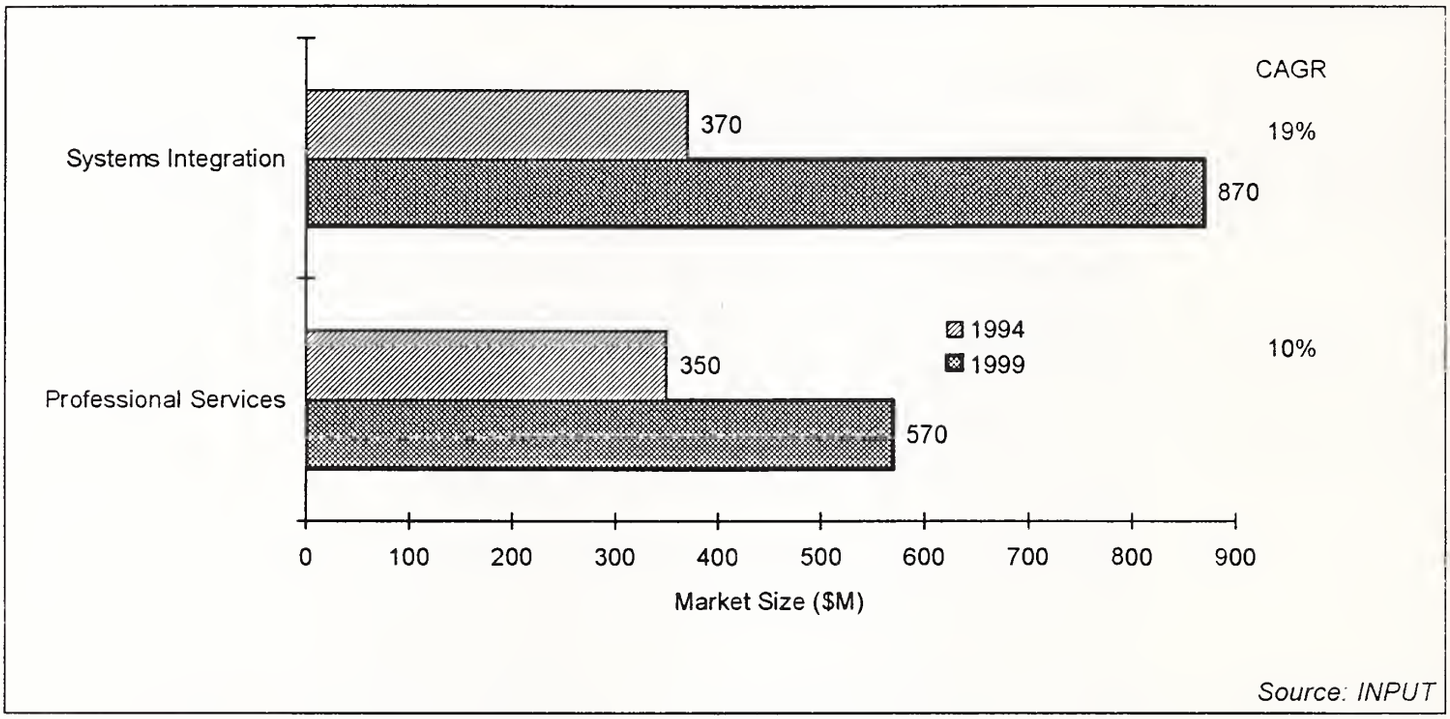
Exhibit V-7

PS and SI in Health Services



Source: INPUT

2. Driving Forces

- Need for improved cost management
- Need for system to support integrated health care delivery (doctor's office/hospital/nursing and home care)
- Need for more data on treatment outcomes

3. Inhibiting Factors

- Unwillingness to face disruption of changing legacy systems (control mainframe-based and departmental turnkey solutions)
- Limited in-house experience and comfort with making IS decisions (conservative environment)
- Extreme cost pressures with limited funds for new investment

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H
Insurance

1. Overview

Insurance industry SI and PS expenditures are shown in Exhibit V-8. Professional services dominates this vertical by being over five times the size of SI services. Systems integration is growing, however, at twice the rate of professional services.

Systems Integration Analysis

Systems integration expenditures are forecast to grow at 17% annually to $600 million by 1999. As insurance companies move toward implementing new technologies and applications with fewer IS staff onboard, the use of a systems integrator to develop the best solution to their specific needs becomes more attractive.

Professional Services Analysis

Professional services expenditures are forecast to grow at a modest 8% annually to $2.5 billion in 1999. As insurers move toward updating legacy systems and evaluating newer technology options such as imaging, EDI and client/server options, professional services companies will play a role in helping to define objectives and implement IS projects.

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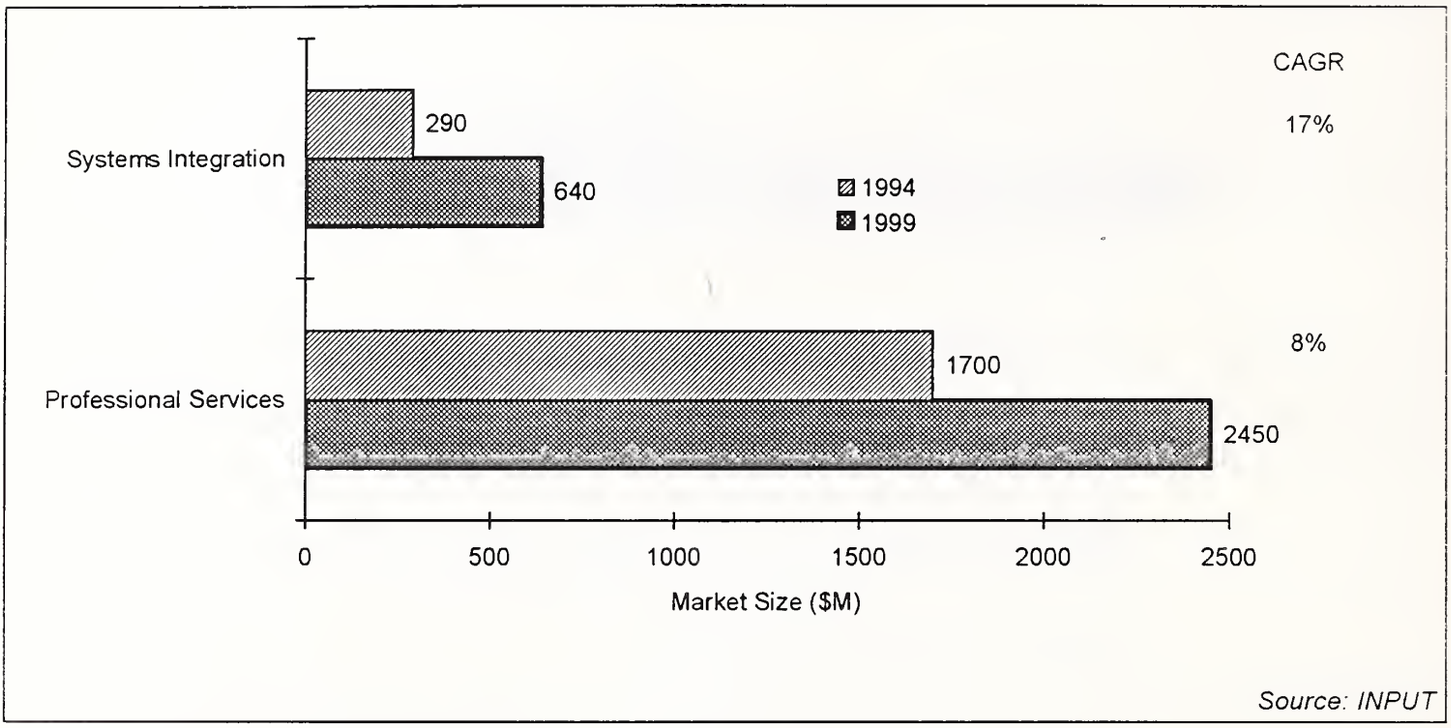
Exhibit V-8

PS and SI in Insurance



Source: INPUT

2. Driving Forces

- Emphasis on customer service
- Restructuring increases emphasis on use of IT
- Replacement of aging legacy systems

3. Inhibiting Factors

- Record-breaking claims payments
- Insurers are seeing to reduce IS costs
- Confusion regarding health care reform
- Competition from in-house operations

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I
Miscellaneous Industries

1. Overview

Miscellaneous industries (including agriculture and construction) SI and PS expenditures are shown in Exhibit V-9. This is primarily a professional services market with insignificant SI expenditures. The minor influence of this vertical is its traditional reluctance to invest in IS solutions.

Systems Integration Analysis

SI expenditures are forecast to grow at 16% CAGR to only $21 million by 1999. There remains little evidence of systems integration solutions use among agricultural producers, although some large ones, such as Pioneer Hi-Bred International, have begun implementing distributed systems that could require this product/service market.

There is a higher level of use of SI in the construction segment, where there is a need for future systems that will use multiplatform/multivendor connectivity and the use of relational database capability.

Professional Services Analysis

Professional services expenditures are forecast to grow at 9% annually to $233 million by 1999. Much of the need for professional services in the agricultural production market, particularly custom development or modification of software products, has been provided by independent software products vendors and turnkey systems suppliers at a price that, in many cases, includes other services and products.

There has been more demand for customized development in the construction market, but it has been curtailed by the recent economic situation. The beginning of a recovery and technological factors such as the use of local-area networks (LANs), are encouraging more growth.

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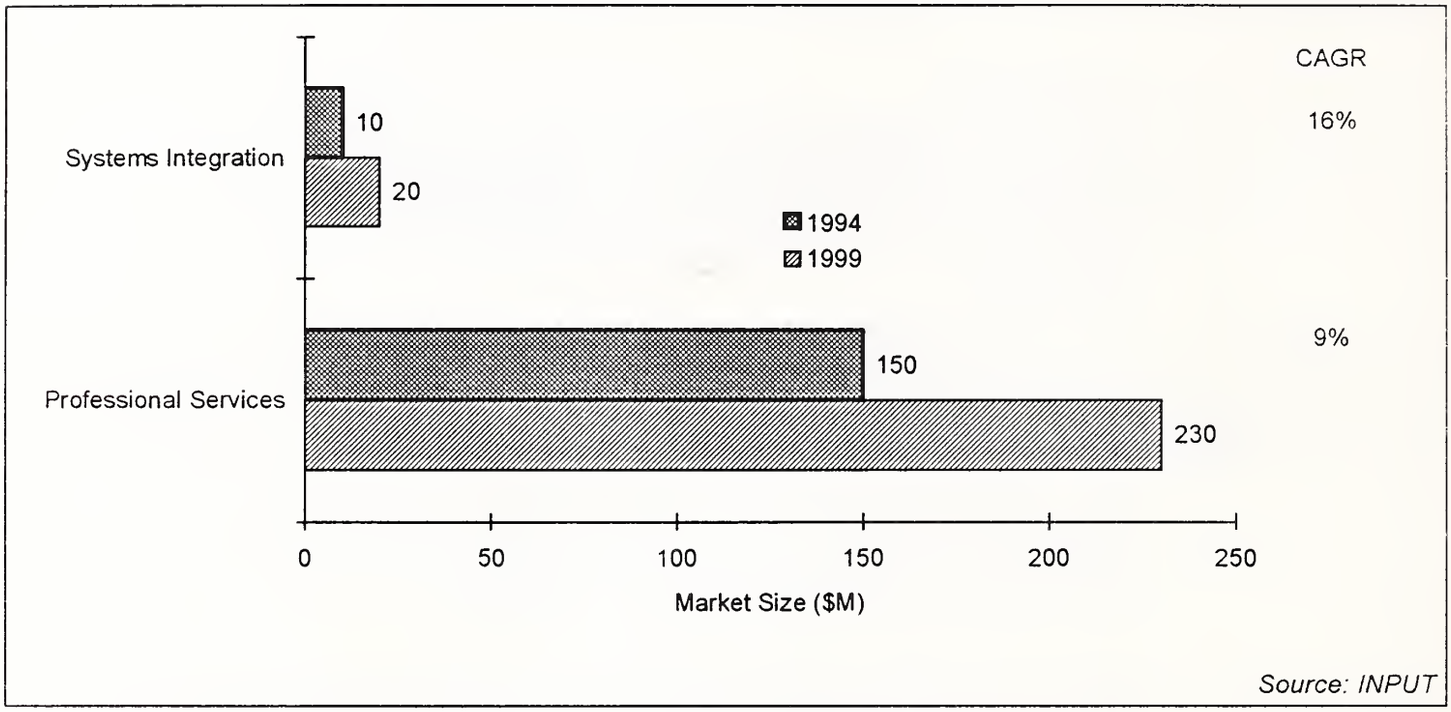
Exhibit V-9

PS and SI in Miscellaneous Industries



Source: INPUT

2. Driving Forces

- Strengthening U.S. economy
- Interest in IS to manage and plan business more effectively

3. Inhibiting Factors

- Agriculture is a mature industry growing at only 1% annually
- Construction industry recovery is slow due to excess commercial facilities and a slow residential real estate market

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J
Process Manufacturing

1. Overview

Process manufacturing SI and PS expenditures are shown in Exhibit V-10. This industry is heavily dominated by professional services.

Systems Integration Analysis

Systems integration will grow at a CAGR of 15% during the forecast period as a result of increased demand for single-source responsibility on major IT projects. Manufacturers who are reengineering their businesses often find that they require specific knowledge in multiple disciplines, which is seldom available in-house. Consequently, the professional services component of SI will grow the fastest. Total expenditures will increase from $505 million to $1 billion between 1994 and 1999.

Professional Services Analysis

The largest category of information services expenditures is professional services. At just under $3.0 billion in 1994, and growing at 15% CAGR throughout the forecast period to almost $5.9 billion, it represents a substantial opportunity. INPUT expects IS consulting and software development to grow steadily, and education and training to accelerate slightly as manufacturers continue internal education efforts in new technologies such as client/server.

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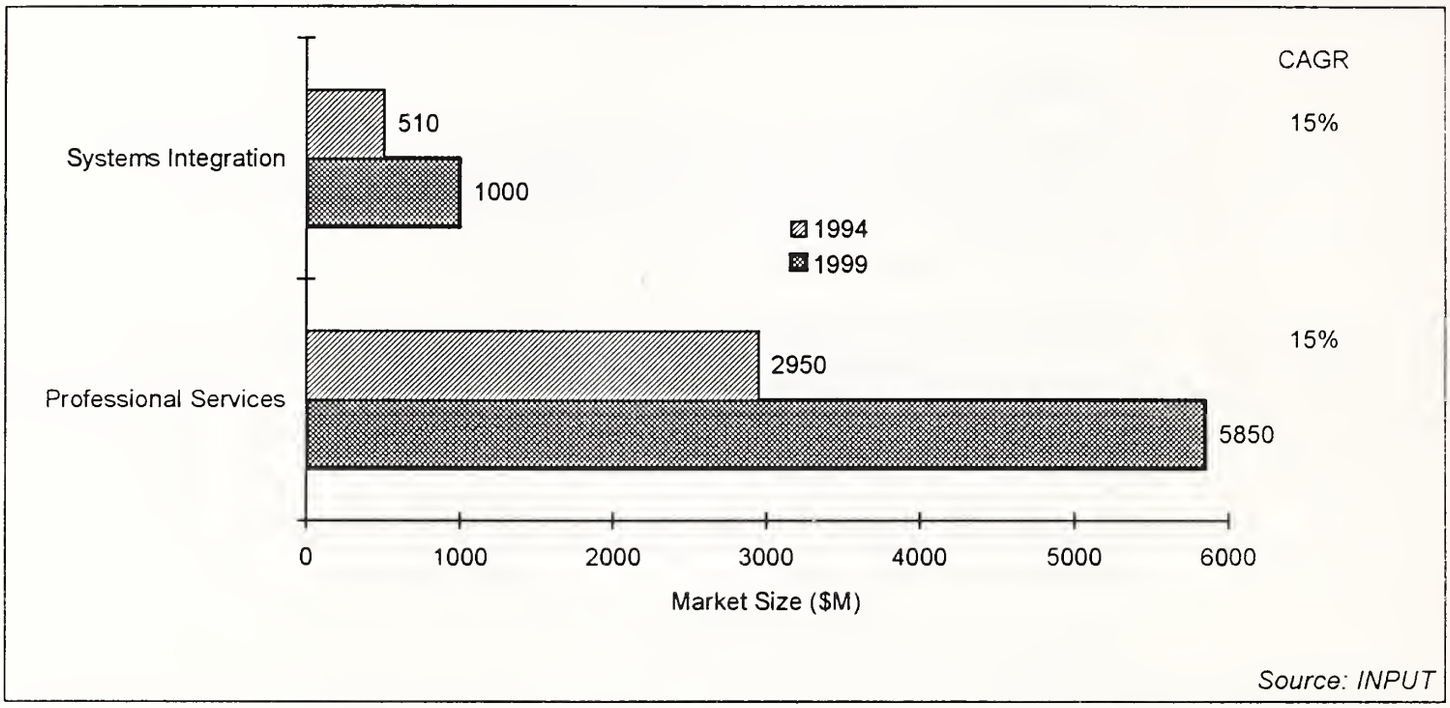
Exhibit V-10

PS and SI in Process Manufacturing



Source: INPUT

2. Driving Forces

- Growth of BPR
- Aggressive SI and PS vendor competition
- Demand for increased user knowledge

3. Inhibiting Factors

- Customization of solutions reduces potential for replication of services
- Vendor sales personnel focus on product features and functions
- Lengthier and more complex buying process

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K
Retail Distribution

1. Overview

Retail distribution SI and PS expenditures are shown in Exhibit V-11. Systems integration is forecast to increase its domination of this vertical market with a five-year growth rate three times that of professional services.

Systems Integration Analysis

Systems integration expenditures are forecast to grow at 21% annually to a level of $1.3 billion by 1999. This growth is being driven by a turnaround in the health of the retail sector and emphasis on technology to achieve faster and improved service from suppliers as well as internal operating efficiency.

Professional Services Analysis

Professional services expenditures are forecast to grow slowly at 7% CAGR to $400 million by 1999. Primary demand is for technical expertise and user interface/training projects as new systems are implemented.

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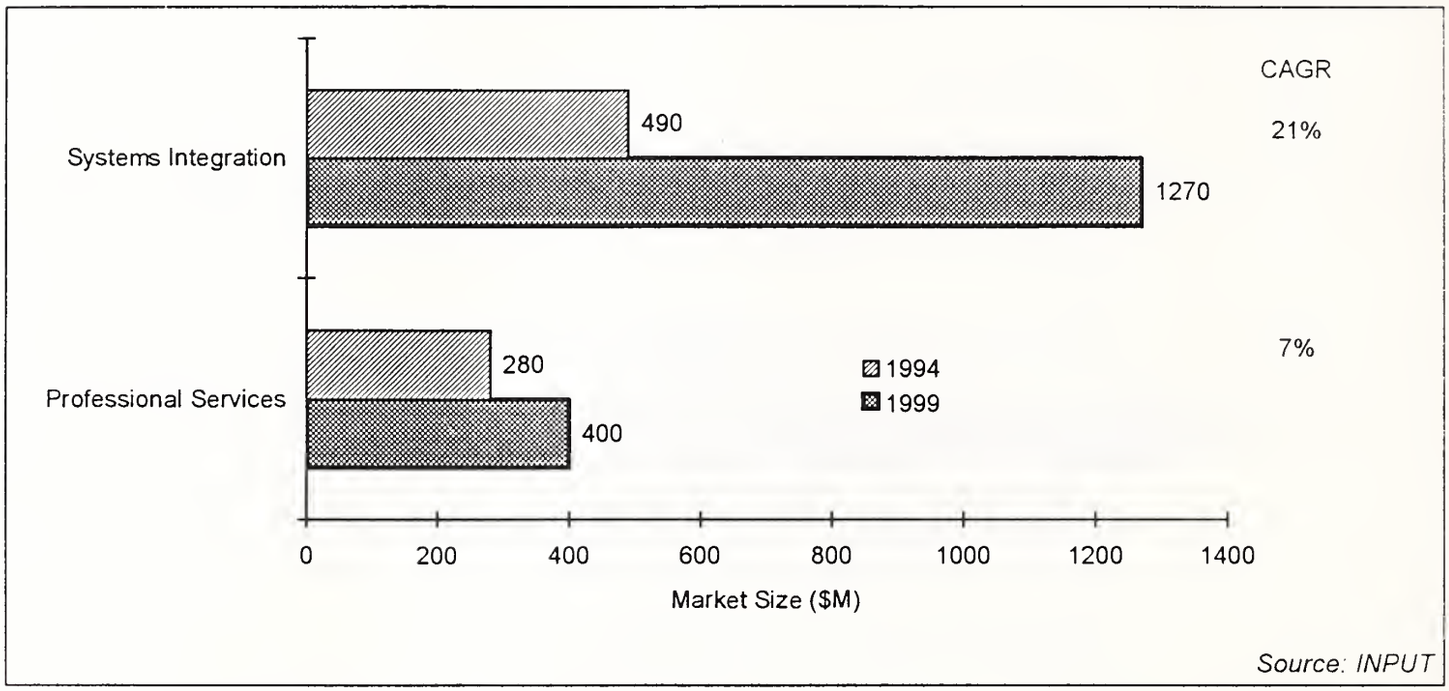
Exhibit V-11

PS and SI in Retail Distribution



Source: INPUT

2. Driving Forces

- Improving consumer confidence
- Expanding use of POS and card technology
- Increased interest in faster supply and improved service
- Expanding use of communications and network services such as EDI
- High rate of growth for use of SI

3. Inhibiting Factors

- Low profit margins
- Precarious condition of some large companies
- Desire to economize on IT expenditures
- Limited number of large companies

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L
State and Local Government

1. Overview

State and local government, SI and PS expenditures are forecast in Exhibit V-12. Professional services dominates this market, being nearly three times larger than SI services. Both are growing at the same modest 11%-12% CAGR.

Systems Integration Analysis

Systems integration expenditures are forecast to grow 12% annually to $2.0 billion by 1999. The need for comprehensive, integrated systems solutions is growing in states, larger cities, and counties, where systems tend to be old and fragmented. Growing public demand for services, coupled with a shifting of the burden from the federal level to the state and local level, are fueling a demand for comprehensive, integrated systems to reduce waste and fraud.

Professional Services Analysis

Professional services expenditures are forecast to grow at 11% annually to $5.6 billion. Professional services remains strong and is growing as governments use outside services for systems design and development.

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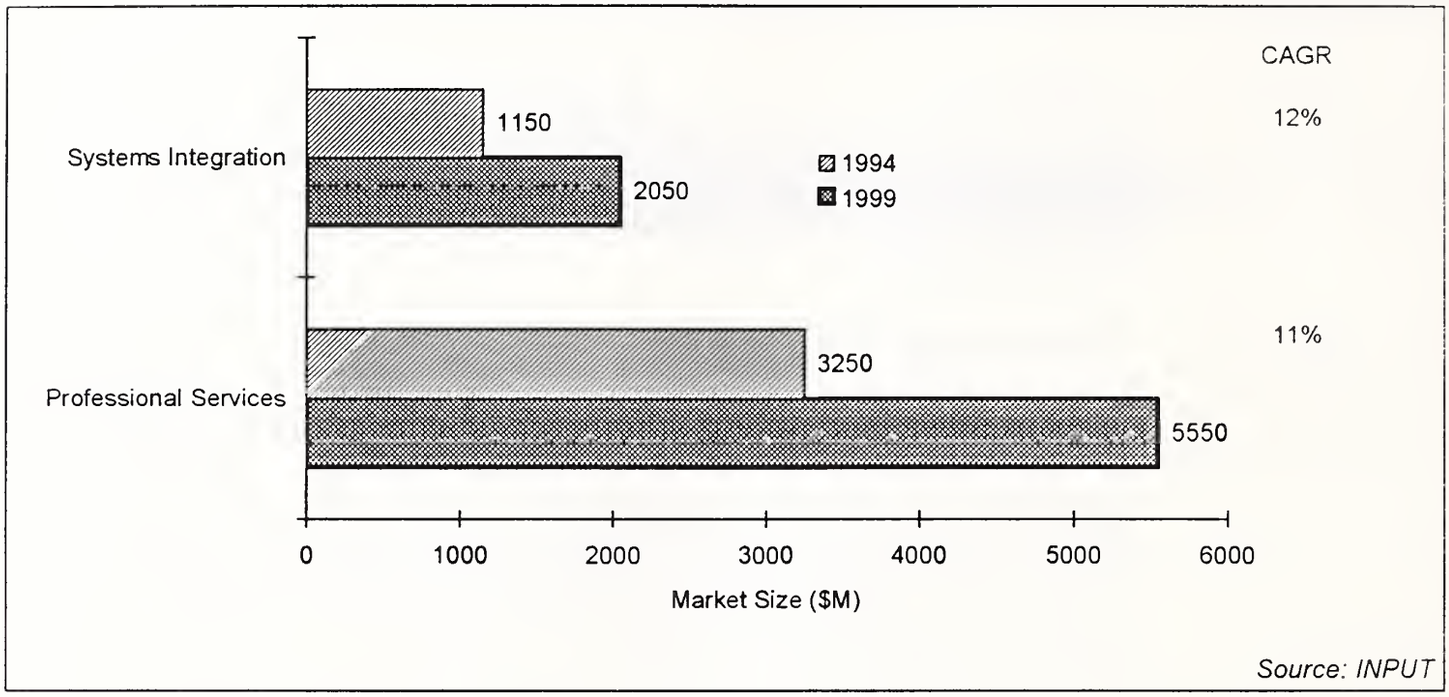
Exhibit V-12

PS and SI in State and Local Government



Source: INPUT

2. Driving Forces

- Increased demand for services to the public is generating increases in use of IT
- Improved affordability of technology
- Legislative mandates necessitate integration of services and systems

3. Inhibiting Factors

- Limited availability of funding
- Lack of qualified personnel
- Political impact concerning information security
- Executives unable to clearly identify the benefits associated with new technology

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M
Telecommunications

1. Overview

Telecommunications SI and PS expenditures are shown in Exhibit V-13. Professional services dominate this vertical, representing nearly 80% of the combined volume. Both SI and PS segments are growing aggressively, driven by rapid technology change and explosive demand for new communications services.

Systems Integration Analysis

Systems integration expenditures are forecast to grow at 24% annually to a level of $1.1 billion in 1999. Competitive pressures spawned by deregulation, and high customer demand for new services/technology, are creating a requirement for new IS systems to support them. Witness cellular and radio-based communications, expanding CATV applications.

Since deregulation, carriers have devoted extensive resources to enhancing their primary applications software. The billing and customer service systems that they inherited functioned poorly and were not able to meet changing needs. The majority of these systems have been either enhanced or replaced. However, the process of integrating major systems and incorporating new areas, such as EDI, is just beginning.

Customer service systems, containing profiles of a wide variety of features and services, must increasingly be linked to maintenance and network configuration systems. Charges for features must be integrated with charges for maintenance and troubleshooting.

There will be a growing need for integrated (network) service delivery systems to support the cable industry. The requirements are expected to begin to appear near the middle of the forecast period.

Professional Services Analysis

Professional services expenditures will grow at 21% annually to $4.0 billion by 1999. Professional services usage is driven by a number of factors:

As a result of severe reductions in staff and the growing complexity of systems, carriers are turning increasingly to professional services to develop system specifications and perform system development, because professional services firms are expected to have a broader knowledge of application needs and requirements.

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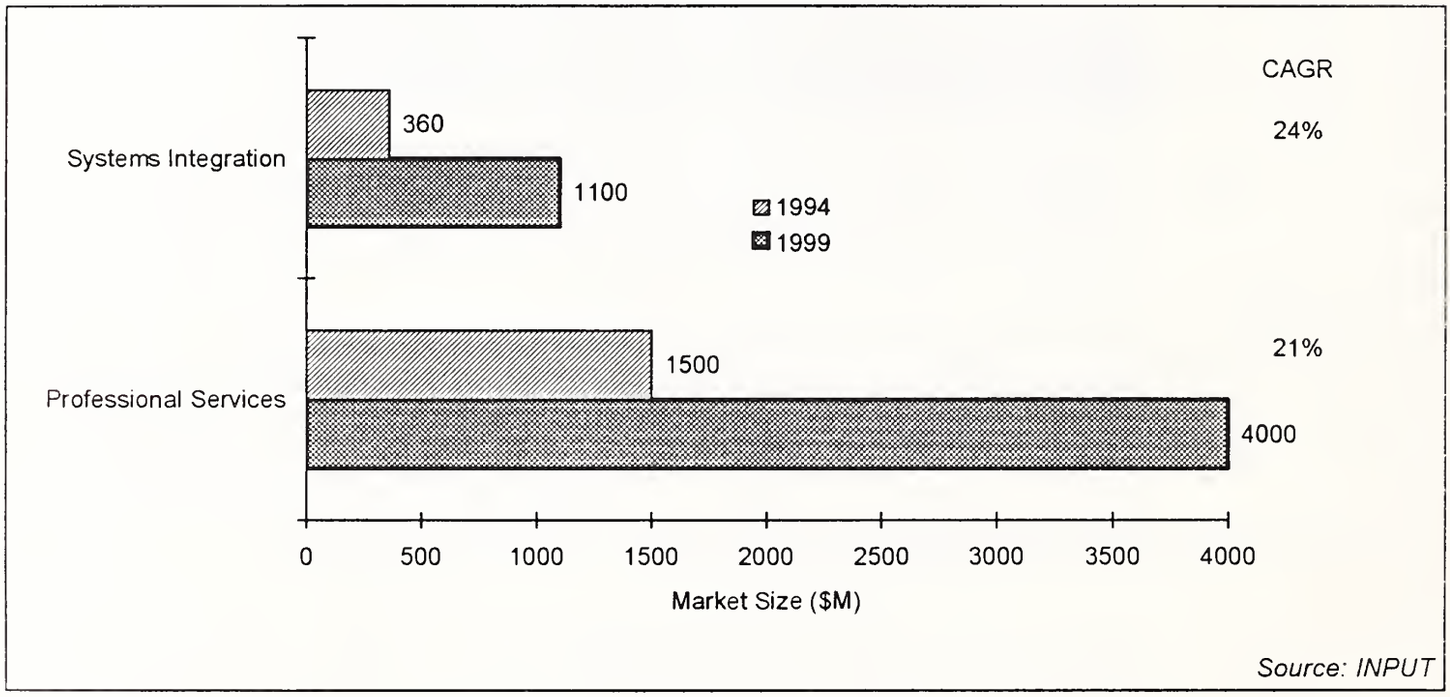
Professional services firms provide a means of training information systems staff in processes and procedures. Although many carriers have upgraded staff skills, information systems managers indicate that additional training is still needed.

Use of professional services also reduces implementation time. As system criticality grows due to the development of revenue-producing services, reducing development time will become more important.

Exhibit V-13

PS and SI in Telecommunications



Source: INPUT

2. Driving Forces

- Deregulation
- Competition with cable industry
- Service/organization integration
- Increased internal user demand

3. Inhibiting Factors

- Regulatory realities make a limited number of cable TV territories appealing
- Uncertainty regarding customer needs
- Unresolved standards

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N
Transportation

1. Overview

Transportation industry SI and PS expenditures are shown in Exhibit V-14. They are approximately equal in size, but SI is growing over three times as fast.

Systems Integration Analysis

Systems integration services will grow at 20% CAGR over the next five years to a level of $700 million. This growth will be fueled primarily by the need to provide connectivity between shippers and modes of shipping. Transportation sector firms have traditionally had a focus on operations and have often lost sight of their role in serving customers. Even the trucking companies, which get the highest service grades from shippers, are not immune from having more concern for tires and fuel than a customer's needs. Although transportation operational systems are still significant, IS is being asked to build systems that are more shipment oriented.

Professional Services Analysis

Professional services expenditures will grow modestly at 6% CAGR over the next five years to $400 million. Transportation sector application projects tend to be significantly more mainframe based than the average of those for all industry sectors in INPUT's sample. INPUT believes that the main reason for this relates to the substantial numbers of large firms within transportation that have been involved with computers for decades. These would include airlines and major railroads that have been major computer users since the 1960s. This, combined with established information services organizations, supports the favored status of mainframe solutions and professional services to support them.

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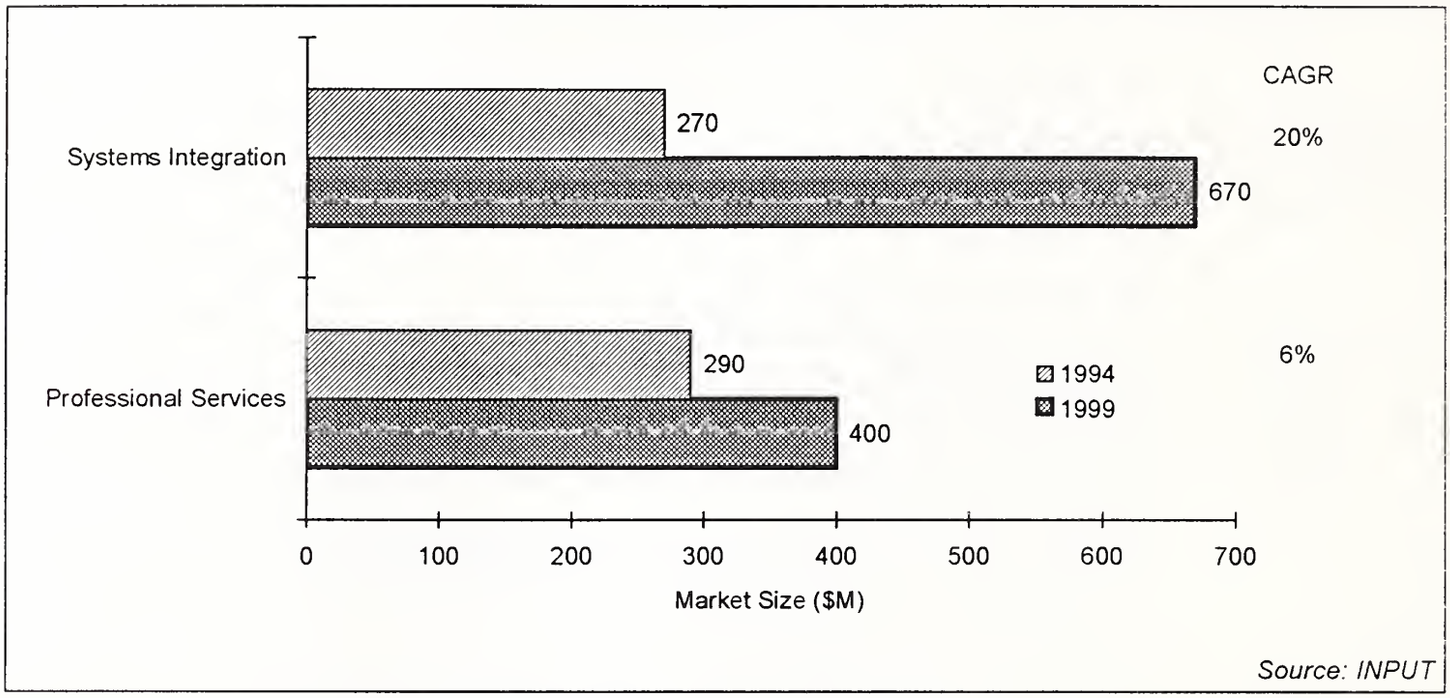
Exhibit V-14

PS and SI in Transportation



Source: INPUT

2. Driving Forces

- Lack of internal expertise
- Emphasis on customer service systems
- IT viewed as a means of cost reduction

3. Inhibiting Factors

- Heavy prior investment in mainframe solutions
- Availability of turnkey system solutions
- Cost containment pressures

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O
Utilities

1. Overview

Utility industry SI and PS expenditures are shown in Exhibit V-15. As opposed to most other vertical markets, SI expenditures are larger and slower growing than professional services expenditures.

Systems Integration Analysis

Systems integration expenditures are forecast to grow at 10% CAGR over the next five years to $1.1 billion. This growth is fueled by the fact that nearly all major operations-type applications in utilities are systems integration opportunities.

Professional Services Analysis

Professional services expenditures are forecast to grow at 14% CAGR annually to $800 million by 1999. The pacing factor in this growth is the need to augment the application and technical knowledge of in-house staff in a drive to replace legacy systems (some 10-20 years old) with modern technology.

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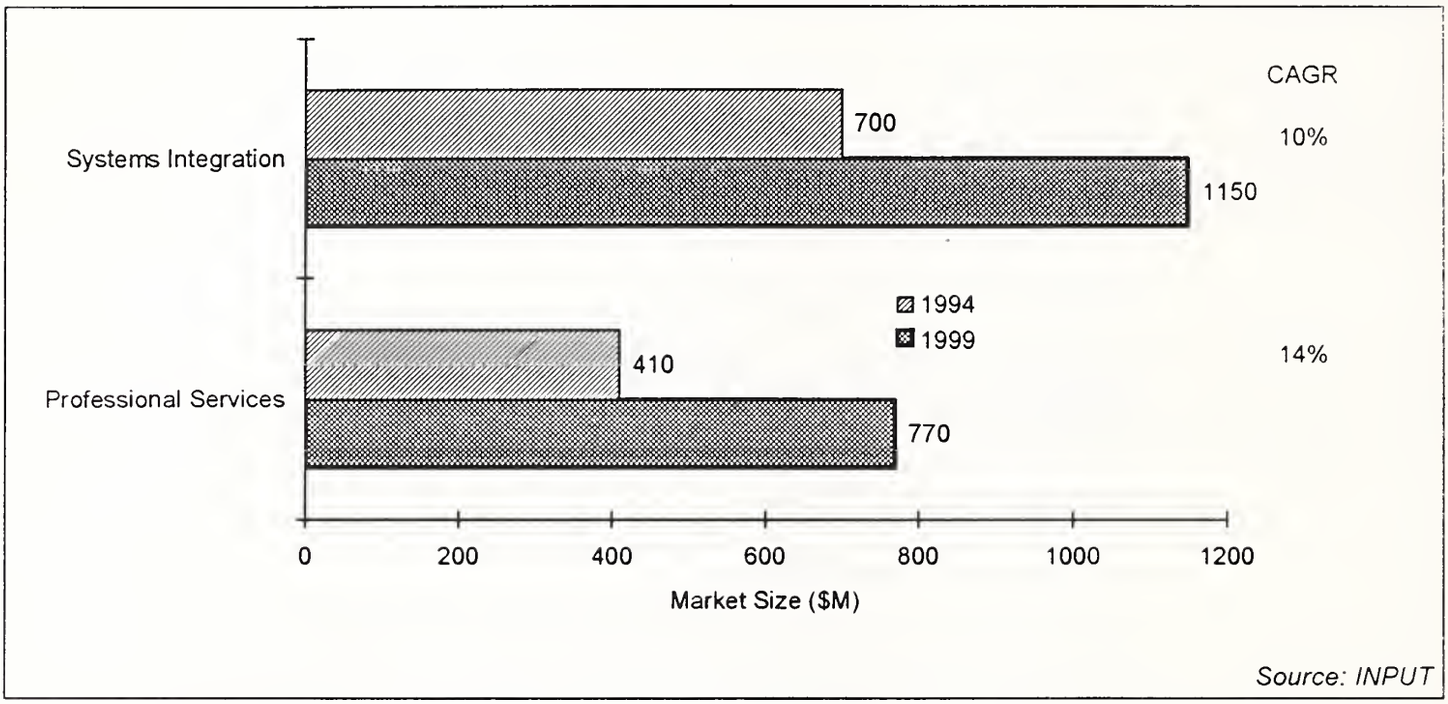
Exhibit V-15

PS and SI in Utilities



Source: INPUT

2. Driving Forces

- Use of outside resources is normal business procedure
- Increasing requirement to integrate operational systems with other corporate systems
- Increasing use of systems aimed at optimizing the use of existing facilities

3. Inhibiting Factors

- Small number of large utility companies
- Pressure to limit new investment
- Lack of competitive pressure
- Decreasing demand for unique high-function customer systems in favor of more packaged applications software solutions

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P
Wholesale Distribution

1. Overview

Wholesale distribution SI and PS expenditures are small compared to most other industries, due to competition from turnkey solutions. Systems integration is growing twice as fast as professional services and will approach the PS market's size by 1999, as shown in Exhibit V-16.

Systems Integration Analysis

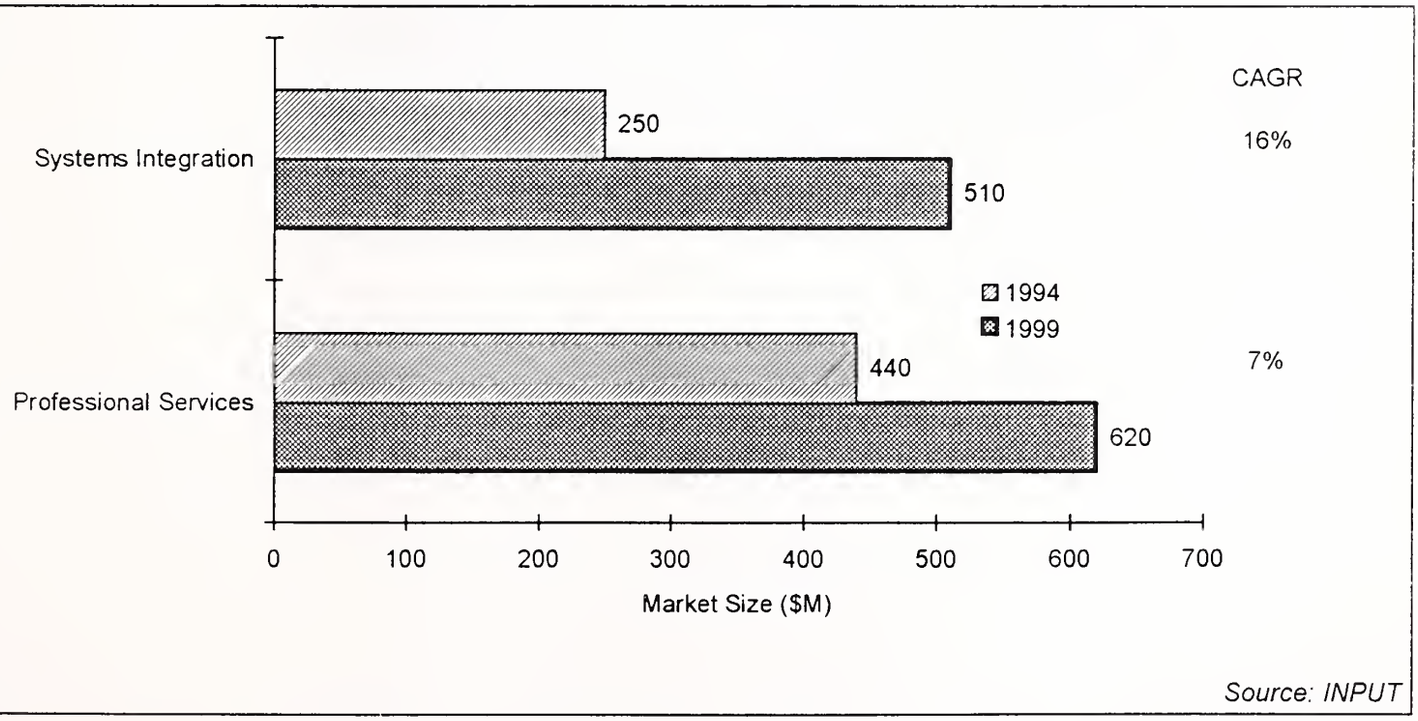
Systems integration expenditures are forecast to grow at 16% CAGR to $500 million by 1999. Fuel for this growth comes from wholesalers' need to make their businesses more responsive to retailers' needs via improved communications, cost reduction and electronic commerce.

Professional Services Analysis

Professional services expenditures are expected to grow at a modest 7% CAGR to $600 million by 1999.

Exhibit V-16

PS and SI in Wholesale Distribution



Source: INPUT

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2. Driving Forces

- Pick-up in the economy and orders
- Need for faster and more responsive service
- Need for improved communication
- Expanding use of electronic commerce
- Possibility of cost savings through downsized systems

3. Inhibiting Factors

- Narrow margins
- Large retailers are bypassing wholesalers
- Small size of many establishments

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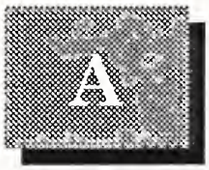

Appendix: Definition of Terms

A
Introduction

INPUT's *Definition of Terms* provides the framework for all of INPUT's market analyses and forecasts of the information services industry. It is used for all U.S. programs. The structure defined in Exhibit A-1 is also used in Europe and for the worldwide forecast.

One of the strengths of INPUT's market analysis services is the consistency of the underlying market sizing and forecast data. Each year INPUT reviews its industry structure and makes changes if they are required. When changes are made they are carefully documented and the new definitions and forecasts reconciled to the prior definitions and forecasts. INPUT clients have the benefit of being able to track market forecast data from year to year against a proven and consistent foundation of definitions.

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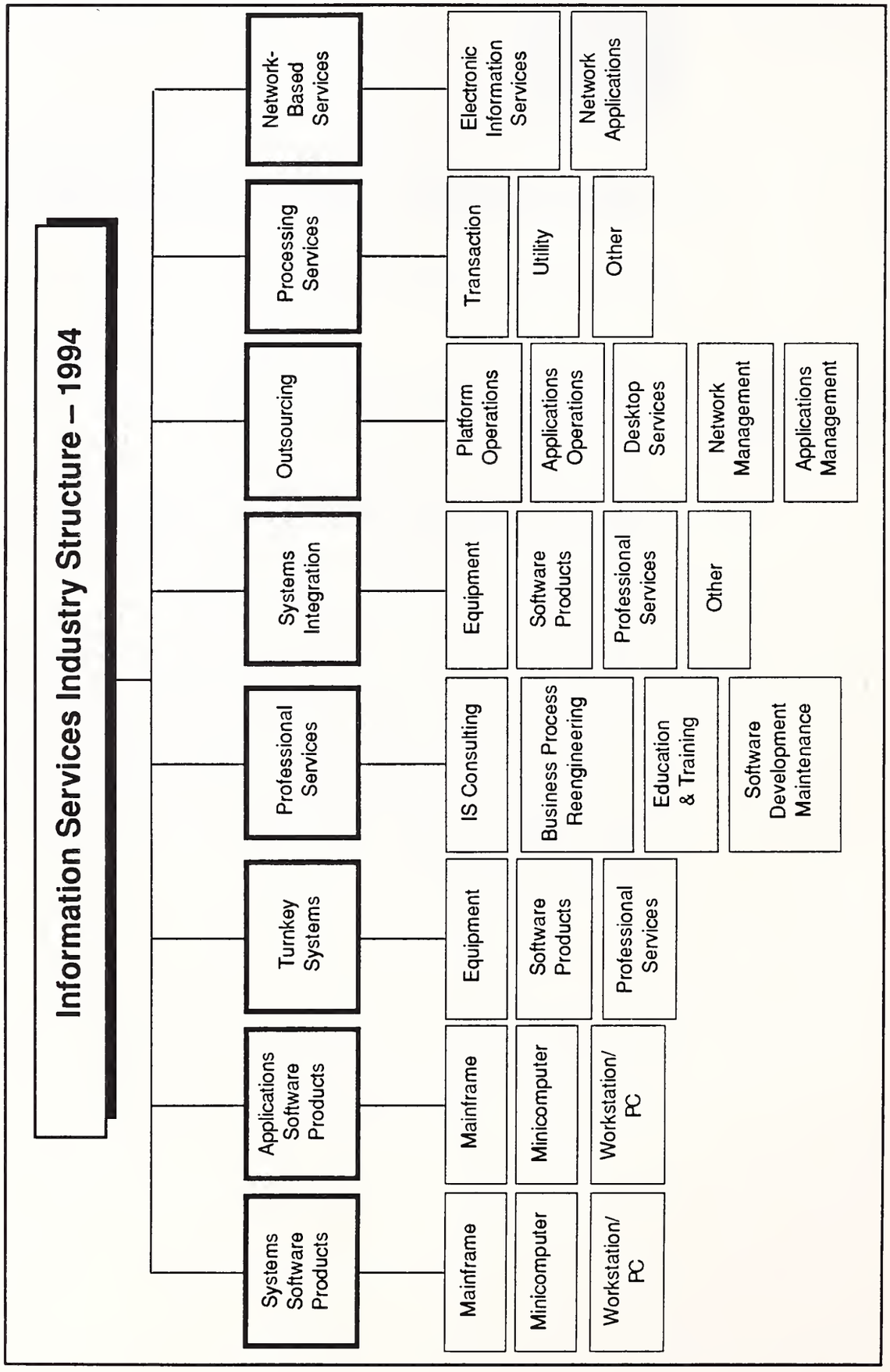
Exhibit A-1



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B
Overall Definitions and Analytical Framework

1. Systems Integration (SI)

Systems integration is a vendor service that provides a complete solution to an information system, networking or automation development requirement through the custom selection and implementation of a variety of information system products and services. A systems integrator is responsible for the overall management of a systems integration contract and is the single point of contact and responsibility to the buyer for the delivery of the specified system function, on schedule and at the contracted price. (Refer to Exhibit A-2.)

The components of a systems integration project are the following:

- *Equipment* - information processing and communications equipment required to build the systems solution. This component may include custom as well as off-the-shelf equipment to meet the unique needs of the project. The systems integration equipment category excludes turnkey systems by definition.

- *Software products* - prepackaged applications and systems software products.

- *Professional services* - the value-added component that adapts the equipment and develops, assembles, or modifies the software and hardware to meet the system's requirements. It includes all of the professional services activities required to develop, implement, and if included in the contract, operate an information system, including consulting, program/project management, design and integration, software development, education and training, documentation, and systems operations and maintenance.

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Exhibit A-2

Products/Services in Systems Integration Projects

Equipment
• Information systems
• Communications
Software Products
• Systems software
• Applications software
Professional Services
• Consulting
- Feasibility and trade-off studies
- Selection of equipment, network and software
• Program/project management
• Design/integration
- Systems design
- Installation of equipment, network, and software
- Demonstration and testing
• Software development
- Modification of software packages
- Modification of existing software
- Custom development of software
• Education/training and documentation
• Systems operations/maintenance
Other Miscellaneous Products/Services
• Site preparation
• Data processing supplies
• Processing/network services
• Data/voice communication services

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- *Other services* - most systems integration contracts include other services and product expenditures that are not classified elsewhere. This category includes miscellaneous items such as engineering services, automation equipment, computer supplies, business support services and supplies, and other items required for a smooth development effort.

2. Professional Services

This category includes four segments: consulting, education and training, software development, and business process reengineering. Exhibit B-3 provides additional detail.

- *Consulting:* Services include management consulting (related to information systems), information systems re-engineering, information systems consulting, feasibility analysis and cost-effectiveness studies, and project management assistance. Services may be related to any aspect of the information system, including equipment, software, networks and systems operations.

- *Education and Training:* Services that provide training and education or the development of training materials related to information systems and services for the information systems professional and the user, including computer-aided instruction, computer-based education, and vendor instruction of user personnel in operations, design, programming, and documentation. Education and training provided by school systems is not included. General education and training products are included as a cross-industry market sector.

- *Software Development:* Services include user requirements definition, systems design, contract programming, documentation, and implementation of software performed on a custom basis. Conversion and maintenance services are also included.

- *Business Process Reengineering:* This is a new segment within the INPUT definition of professional services. BPR is defined as the fundamental rethinking and radical redesign of business processes to achieve dramatic improvements in critical, contemporary measures of performance, such as cost, quality, service and speed.

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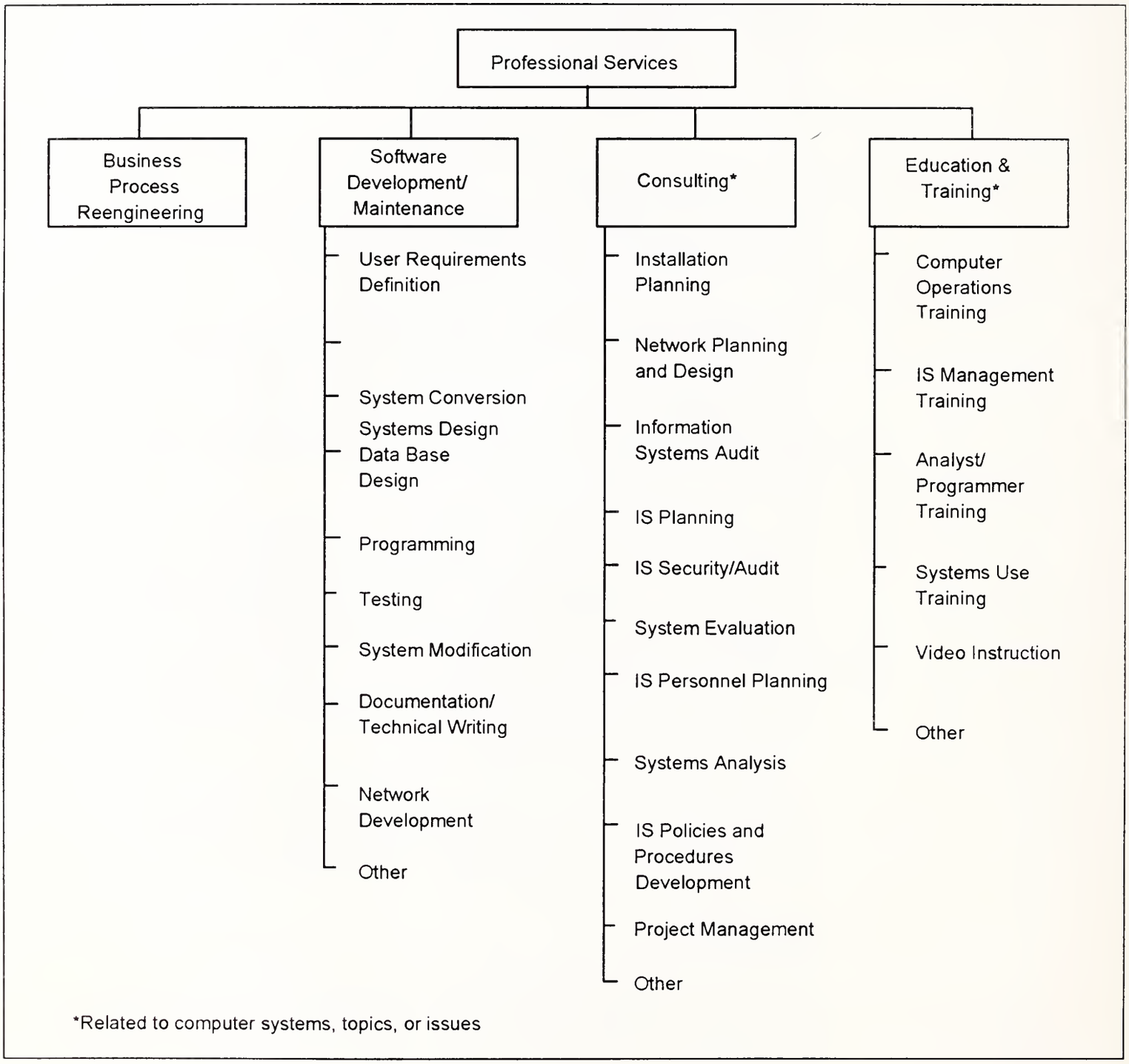
Exhibit A-3

Professional Services Market Structure



*Related to computer systems, topics, or issues

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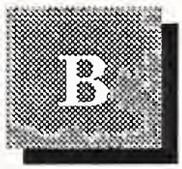

Appendix: Systems Integration and Professional Services Forecast and Reconciliation

A
Systems Integration Forecast

Exhibit B-1

U.S. Systems Integration Market, 1993-1999 by Submode

Delivery Mode	1993 ($ M)	Growth 93-94 (%)	1994 ($ M)	1995 ($ M)	1996 ($ M)	1997 ($ M)	1998 ($ M)	1999 ($ M)	CAGR 94-99 (%)
Systems Integration	9989	12%	11184	12840	14807	17085	19704	22673	15%
- Equipment	4612	10%	5059	5764	6585	7559	8644	9868	14%
- Software Products	768	10%	848	983	1150	1330	1546	1750	16%
- Professional Services	4233	15%	4879	5628	6530	7574	8801	10269	16%

Source: INPUT

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Exhibit B-2

U.S. Systems Integration Market, 1993-1999 by Industry Sector

Market Sectors	1993 ($ M)	Growth 93-94 (%)	1994 ($ M)	1995 ($ M)	1996 ($ M)	1997 ($ M)	1998 ($ M)	1999 ($ M)	CAGR 94-99 (%)
Total All Sectors	9989	12%	11184	12840	14807	17085	19704	22673	15%
Banking and Finance	601	15%	689	804	967	1188	1452	1786	21%
Business Services	235	26%	297	361	442	540	658	794	22%
Discrete Manufacturing .	1631	19%	1948	2325	2800	3396	4124	4977	21%
Education	121	16%	140	165	198	231	266	305	17%
Federal Government	3603	3%	3707	4093	4501	4887	5256	5541	8%
Health Services	310	18%	366	438	515	609	721	866	19%
Insurance	245	18%	288	338	396	465	545	641	17%
Miscellaneous	9	11%	10	12	14	16	19	21	16%
Process Manufacturing	447	13%	505	580	675	774	887	1019	15%
Retail Distribution	409	21%	493	592	711	858	1037	1268	21%
State and Local Government	1015	14%	1161	1299	1454	1628	1825	2047	12%
Telecommunications	293	24%	364	453	564	702	872	1086	24%
Transportation	225	20%	271	325	390	469	563	665	20%
Utilities	634	10%	700	771	852	942	1040	1148	10%
Wholesale Distribution	211	16%	245	284	328	380	439	509	16%

Source: INPUT

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B

Professional Services Forecast

Exhibit B-3

U.S. Professional Services Market, 1993-1999 by Submode

Delivery Mode	1993 ($ M)	Growth 93-94 (%)	1994 ($ M)	1995 ($ M)	1996 ($ M)	1997 ($ M)	1998 ($ M)	1999 ($ M)	CAGR 94-99 (%)
Professional Services	20778	11%	23000	25377	28020	30963	34281	37994	11%
- IS Consulting	5165	13%	5830	6566	7386	8313	9362	10548	13%
- Education & Training	3096	11%	3430	3783	4171	4603	5090	5640	10%
- Software Development	12517	10%	13740	15028	16463	18047	19829	21806	10%

Source: INPUT

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Exhibit B-4

U.S. Professional Services Market, 1993-1999 by Industry Sector

Market Sectors	1993 ($ M)	Growth 93-94 (%)	1994 ($ M)	1995 ($ M)	1996 ($ M)	1997 ($ M)	1998 ($ M)	1999 ($ M)	CAGR 94-99 (%)
Total All Sectors	20778	11%	23000	25377	28020	30963	34281	37994	11%
Banking and Finance	2588	11%	2885	3135	3393	3684	3992	4333	8%
Business Services	352	8%	379	410	440	469	499	527	7%
Discrete Manufacturing	5194	7%	5580	5961	6377	6831	7327	7869	7%
Education	98	12%	110	121	134	146	161	178	10%
Federal Government	2468	11%	2736	3009	3299	3574	3881	4181	9%
Health Services	319	10%	350	379	412	454	507	572	10%
Insurance	1600	6%	1700	1831	1971	2125	2291	2470	8%
Miscellaneous	142	8%	154	168	183	200	216	233	9%
Process Manufacturing	2569	14%	2936	3365	3861	4433	5094	5856	15%
Retail Distribution	257	8%	277	298	321	346	371	396	7%
State and Local Government	2900	12%	3234	3605	4019	4481	4996	5572	11%
Telecommunications	1250	22%	1519	1844	2241	2721	3308	4021	21%
Transportation	269	8%	290	313	334	357	376	395	6%
Utilities	362	14%	411	467	530	601	684	775	14%
Wholesale Distribution	410	7%	439	471	505	541	578	616	7%

Source: INPUT

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C
Systems Integration and Professional Services Reconciliation

Exhibit B-5

U.S. SI and PS Market
Forecast Reconciliation — 1993 Market

	1993 Market			
Delivery Mode/Submode	1993 Market (Forecast) ($M)	1994 Report (Actual) ($M)	Variance from 1993 Forecast ($M)	Variance from 1993 Forecast (%)
Professional Services	20930	20778	-152	-1%
- IS Consulting	5154	5165	11	0%
- Education & Training	3113	3096	-17	-1%
- Software Development	12663	12517	-146	-1%
Systems Integration	10076	9989	-87	-1%
- Equipment	4707	4612	-95	-2%
- Software Products	767	768	1	0%
- Professional Services	4210	4233	23	1%
- Other	392	376	-16	-4%

Source: INPUT

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Exhibit B-6

U.S. SI and PS Market
Forecast Reconciliation — 1998 Market

Delivery Mode/Submode	1998 Market			
	1993 Market (Forecast) ($M)	1994 Report (Forecast) ($M)	Variance from 1993 Forecast ($M)	Variance from 1993 Forecast (%)
Professional Services	33542	34281	739	2%
- IS Consulting	9297	9362	65	1%
- Education & Training	4816	5090	274	6%
- Software Development	19429	19829	400	2%
Systems Integration	19361	19704	343	2%
- Equipment	8543	8644	101	1%
- Software Products	1544	1546	2	0%
- Professional Services	8522	8801	279	3%
- Other	752	713	-39	-5%

Source: INPUT

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Exhibit B-7

U.S. SI and PS Market Forecast Reconciliation — CAGR

Delivery Mode/Submode	1993-1998 CAGR per data 1993 report (%)	1993-1998 CAGR per data 1994 report (%)
Professional Services	10%	11%
- IS Consulting	13%	13%
- Education & Training	9%	10%
- Software Development	9%	10%
Systems Integration	14%	15%
- Equipment	13%	13%
- Software Products	15%	15%
- Professional Services	15%	16%
- Other	14%	14%

Source: INPUT

There were only minor changes between the systems integration and professional services forecasts in this year's and last years report's. In 1993, the forecast for systems integration was $10,076 million compared with an actual expenditure of $9,989 million. A shortfall in expenditure in the federal government was the prime cause of this discrepancy. The federal government spent $3,603 million on SI, compared with an forecast expenditure of $3,750 million. All commercial vertical markets either spent as forecast or exceeded the forecast. The 4% variance in the submode "other" is attributable to the small base; therefore, relatively small changes in the absolute number appear as relatively large percentage changes.

In professional services, there were no significant deviations from the forecast in any market.

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